Air Conditioning & REFRIGERATION NEWS

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IN THIS ISSUE

If It's 'Fixed'—Watch Out!
To most of us all our expenses probably seem to be "fixed," but to an accountant, the ratio of fixed to variable expenses is a highly significant factor—and perhaps the difference between the profitable and unprofitable dealer operations, says Arthur Roberts on page 6.

* * *

Shoot That Steak To Me, Jake
Some show-offs go into restaurant kitchens to make a point of selecting their steaks, but all of us (particularly after we've been served) at one time or another wish we had the opportunity to pick and choose our vittles when we dine out. So a restaurant proprietor in Detroit literally surrounds his customers with displays of foods—under refrigeration of course. Page 11.

* * *

New Kind of Air Conditioned Mine
On the same page is the story of a mushroom growing enterprise in an abandoned mine—with air cooling.

* * *

Hold Your Own Quiz
Maybe we should have printed the answers in another part of the issue, but if any of you service engineers want to quiz yourself on the main questions asked during the recent big meeting at Toronto, just cover up the answers with a piece of paper. The problems are ones you probably meet every day—and the answers are short and very helpful. Page 12.

* * *

Progressive Farmers
There's a growing interest among farmers in low temperature equipment—freezing and storage—in good sized cabinets for farm use. What this market comprises is expertly analyzed on page 15.

* * *

Very Tricky
Theater cooling is a specialized market for air conditioning—and naturally there are some tricks to it. Some of those tricks are told in the story on page 8.

* * *

Deepfreeze Saga
The "Deepfreeze" people have created something of a furore with their forward-looking merchandising program, but there is also an interesting story in the engineering development back of their product. Told by a man not with their organization but who was in on the development from almost its inception. Page 12.

BULLETIN . . . .

Tinned copper ice cube trays, with rubber grids, will shortly be supplied by at least two of the leading household refrigerator manufacturers. New production equipment and materials have been ordered, and production is to begin soon.

No further news of developments in plastic trays has been heard. Rubber trays, which have been used before by the industry, are all set for quantity production the moment anyone says "go." Porcelain-on-steel trays are being considered.

As told in last week's NEWS, dealers have been instructed to begin at once removing all but the OPM quota of aluminum ice trays from all refrigerators they now have in stock, crated or uncrated.

Inasmuch as refrigerators are now being shipped without any ice trays at all, unless the dealer complies with these instructions, and begins saving aluminum trays, he will soon have no trays at all with the refrigerators he has for sale.

The NEWS is following closely the supply situation in the industry and in Washington, and will present dealers with last-minute news on priorities as they affect refrigeration as rapidly as such news develops. Because of our connections in Washington, many such developments may be predicted in advance (as were aluminum priorities, on which the NEWS "beat the gun" by several weeks).

Rema Meets May 7-9 At French Lick

CHICAGO—Plans for the Sixth Annual Meeting of the Refrigeration Equipment Manufacturers Association at French Lick, Ind., May 7-8-9, as recommended by the organization's executive committee, have been approved by its board of directors.

The board also accepted the committee's general recommendations for the Fourth All-Industry Refrigeration & Air Conditioning Exhibition, sponsored and managed by Rema. It will be held Jan. 12-15, 1942 in the Stevens hotel, Chicago.

As now planned the first of the three days at French Lick will be devoted to committee meetings, conferences between Rema contact committees and similar committees from other related organizations in the industry and a board of directors meeting.

(Concluded on page 2, Column 3)

Millionth Hotpoint Range Produced

CHICAGO—On March 24 electric cooking development reached a milestone when Hotpoint electric range No. 1,000,000 came from the assembly line in the Hotpoint company's factory in Chicago.

It is estimated that well over 2,500,000 electric ranges are in use in American homes. Hotpoint is the first manufacturer to produce one million of them.

The first electric range to be sold successfully was made in a basement on South Dearborn St., Chicago, in 1910, by George A. Hughes, now

(Concluded on Page 20, Column 2)

* * *

2-Mos. Household Shipments Near 750,000 Units

DETROIT—Continuing on their record-breaking way with only a slight dip from January's record-breaking total, world shipments of household electric refrigerators by U. S. manufacturers reached 365,000 units in February to bring the figure for the first two months of 1941 to approximately 748,000 units, according to estimates by AIR CONDITIONING

(Concluded on Page 2, Column 1)

Union Fight Delays Piping Plane Plant

BUFFALO—A jurisdictional dispute between steamfitters and plumbers over who should install the piping has slowed up installation of the heating, ventilating, and air conditioning equipment in the new Curtiss Airplane plant now being erected at Buffalo airport, reports Joseph Davis, who has the sub-contract for this work.

Although his company had nothing to do with the piping contract, 30 steamfitters in his employ have been ordered to stop work because of the jurisdictional dispute, Mr. Davis said. Between 20 and 25 helpers also ceased work because of the union argument, he declared.

Mr. Davis said an effort was being made to settle the dispute through George Masterson, national president and organizer for United Association of Plumbers & Steamfitters in Washington, D. C.

Fedders' 1940 Net Income Totals $269,504

BUFFALO—Fedders Mfg. Co. reported 1940 net income after taxes of $269,504, equal to $1.12 a share, compared with $226,012, or 94 cents a share in 1939.

Dealers To Sell Appliances For Defense Homes

New Housing Measure Rules Out Purchases By Government

WASHINGTON, D. C.—Dealers in electric refrigerators and ranges have been given a better "break" in the second defense housing appropriation bill, recently passed by the House calling for an additional appropriation of $150,000,000.

An amendment added to the bill in the Rules Committee provides that no movable equipment shall be installed in the housing units to be constructed under this appropriation unless the Federal Works Administrator shall deem it in the public interest.

"The little man on the corner" was brought into the debate on the House floor by Representative W. G. Magnuson, of Washington, who said Congress should not forget the dealer in the new program.

Under the first appropriation bill of $150,000,000 passed last fall, the Federal Works Agency set out to equip the 68,000 odd units on the program with electric refrigerators, ranges, and water heaters, purchasing these direct from the manufacturers.

In the additional appropriation bill, which will provide for an estimated 70,000 units, the market is thrown open to the retailer.

The amended provision is not primarily in the interests of the retailer. The house included it as an economy measure. Refrigerators and ranges were described as "frills of a more abundant life" which could be left aside for another day.

It was pointed out, however, that many defense plant workers who will occupy the housing units are accustomed to earn from $5 to $25 a day and are well able to purchase refrigerators.

There was some opposition to the amendment on the ground that the houses would be of greater value, when and if the Government decides to sell them after the emergency is over, if they were equipped with ranges and refrigerators. The houses will cost approximately $3,000 and will rent from $20 to $30 a month.

Cause For Celebration

R. W. Turnbull, vice president; G. H. Smith, general merchandising manager; and Ward Schafer, range sales manager, go over the plan book which Hotpoint distributors will use as a guide in assisting retailers with local activities commemorating the one-millionth Hotpoint electric range. Models in the same style as the "millionth" will be featured in the campaign.

Criticism of Dealers' Sales Tactics Implied In Utility's Advisory Plan

DALLAS, Tex.—A free advisory service aimed at forestalling the creation of unsoundly engineered and improperly equipped locker plants in its territory has been instituted by Texas Power & Light Co.

The locker business has boomed so rapidly in Texas, and the turnover of firms engaged in the building of locker plants has been so great, that the sale of equipment has become the dominant factor and competent engineering has been shunted into the background, reports a representative of the utility.

This unfortunate relationship has created a number of problems, this representative reports. One of the greatest of these has been the fact that many of the improperly engineered plants fail to live up to the optimistic operating cost figures outlined by the builder, with the result that the plant owner and operator promptly complains to the utility about his exhorbitant power costs.

So by offering its advisory service the utility is attempting to kill two birds with one stone—to satisfy the locker plant operator's desire for maximum efficiency and to achieve its own desire for satisfied power consumers.

The service is being made available to dealers and contractors as well as to prospective operators. It is based on a questionnaire in which the inquirer is asked specific questions on details of the proposed installation. Boiled down, these questions seem to sum up to "What are you going to do and how are you going to do it?"

In other words, the utility hopes to determine prior to the construction of a locker plant just how the bidder plans to keep the promises he may make for his equipment. The dealer or builder who wants to know if his plans are sound can obtain the utility's best advice simply by requesting it.

Appearance of the advisory service has occasioned some complaints from individuals and organizations engaged in the locker industry who have viewed it with considerable misgiving as an unwarranted intrusion by the utility into a field not its own. There have even been suggestions that the utility was using the advisory service as a means of pushing installation of ammonia systems in opposition to those of the low pressure variety.

(Concluded on Page 20, Column 1)

No Samples on Hand, So Dealer Flies Prospect To Factory For Look

INDIANAPOLIS—Taking a prospect on an airline trip to close the sale of two special 8-ft. beverage coolers priced at $1,500 may be a little unusual in the commercial refrigeration business, but it is "all in the day's work" for W. T. Finney of Finney Bros. Refrigeration Co. here. When Mr. Finney found that A. L. Skidmore was interested in two blower-type coolers that he did not have in stock, Mr. Finney took immediate and decisive action.

Mr. Finney knew that if his prospective customer could see the units, built by the Ideal Beer Cooler Co. of St. Louis, the customer would sign the order. He suggested a trip to the factory at St. Louis, but Mr. Skidmore could not take much time away from his business.

At this point Mr. Finney was resourceful. He took Mr. Skidmore to the airport and purchased two round trip tickets to St. Louis. After a short flight in the early afternoon, the two men looked over the Ideal line, and closed the deal.

They took the evening plane back to St. Louis and went home to bed.

12 Nema Companies Report February Sales of 347,337 Household Units

The following 12 companies reported sales to the Refrigeration Division of the National Electrical Manufacturers Association (Nema) on household electric refrigerators for February, 1941:

Crosley Corp., Edison General Electric Appliance Co., Inc., Frigidaire Div. General Motors Corp., Gale Products Div. Outboard Marine & Mfg. Co., General Electric Co., Gibson Electric Refrigerator Co., Kelvinator Div. Nash-Kelvinator Corp., Leonard Div. Nash-Kelvinator Corp., Norge Div. Borg-Warner Corp., Stewart-Warner Corp., Sunbeam Electric Mfg. Co., and Westinghouse Electric & Mfg. Co.

The sales of the reporting companies include units manufactured for the following concerns: Montgomery Ward & Co., Potter Refrigeration Corp., and Sears, Roebuck & Co.

SALES FOR FEBRUARY, 1941

	Domestic	Canadian	Other Foreign	Total World
Lacquer (Ext.) Cabinets Complete				
1. Less than 4 cu. ft.	1,883	68	1,088	3,039
2. 4 to 4.99 cu. ft.	9,825	1,019	1,993	12,837
3. 5 to 5.99 cu. ft.	2,404	383	130	2,917
4. 6 to 6.99 cu. ft.	246,472	2,665	3,884	253,021
5. 7 to 7.99 cu. ft.	18,567	1	812	19,380
6. 8 to 8.99 cu. ft.	29,356	118	666	30,140
7. 9 to 12.99 cu. ft.	7,113	...	358	7,471
8. 13 cu. ft. and up	12	...	8	20
9. Total Lacquer	315,632	4,254	8,939	328,825
Porcelain (Ext.) Cabinets Complete				
10. Less than 5 cu. ft.	...	...	...	...
11. 5 to 5.99 cu. ft.	150	1	8	159
12. 6 to 6.99 cu. ft.	11,866	...	296	12,162
13. 7 to 7.99 cu. ft.	1,444	...	72	1,516
14. 8 to 8.99 cu. ft.	1,541	...	76	1,617
15. 9 to 12.99 cu. ft.	2,646	...	154	2,800
16. 13 cu. ft. and up	56	...	8	64
17. Total Porcelain	17,703	1	614	18,318
18. Total—Lines 9 and 17	333,335	4,255	9,553	347,143
19. Separate Systems, ¼ Hp. or Less	...	...	194	194
20. Total Household Equipment	333,335	4,255	9,747	347,337
Value Index*	262.0	621.0	123.0	255.0

*Based on weighted sales for 1934, 1935, and 1936.

1941 Sales Lead 1940 By 219,000 Units

(Concluded from Page 1, Column 4)

& REFRIGERATION NEWS.

February world shipments also established a new high mark for that month, exceeding the previous record total of 290,000, set last year, by approximately 75,000 units. For the two months, world shipments this year are approximately 219,000 units above those for 1940, which reached 529,000 units.

World shipments by 12 manufacturers reporting to the Refrigeration Division of National Electrical Manufacturers Association totaled 347,337 units during February, to bring the two-month figure for the Nema group to 710,895 units. This compares with 503,188 units shipped by Nema firms in the same months of last year, and represents a gain of 207,707 refrigerators.

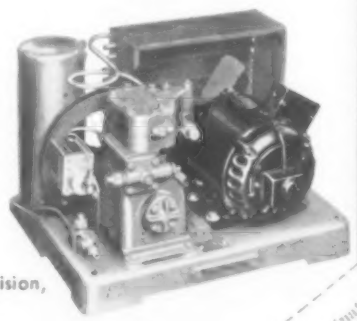
February shipments by Nema companies to distributors and dealers in the U. S. alone amounted to 333,335 units during February, to push the two-month total for U. S. sales to 683,236 units.

Sixes and eights continued to dominate the sales-by-models picture, with 265,183 of the month's shipments being in the 6-foot classification, and another 32,940 units being in the 8-foot size range. Shipments to U. S. outlets included 258,338 6-foot and 32,002 8-foot models.

How Can I Build a Better Service Business?

The answer's easy! For dependable refrigeration parts and supplies experienced servicemen go to Kelvinator. Then they go out and reap the reward of more business—satisfied customers—increased profits.

The complete line of Kelvinator refrigeration supplies and condensing units paves the way for a successful service business. A nation wide system of strategically located stocks makes possible prompt deliveries—and the Kelvinator name is a guarantee of quality!



Send the coupon for catalogs.

Kelvinator Commercial, Parts & Service Division, Nash-Kelvinator Corp. Detroit, Mich.

Get More— Get KELVINATOR

Please send me complete information on Kelvinator ☐ Parts and Supplies ☐ Commercial Equipment

Name.....

Address.....

City..... State..... K-Ho

Show Space Drawing To Be Held During Rema May Meeting

(Concluded from Page 1, Column 2)

The general membership meeting will begin at 9:30 a.m. on Thursday, May 8. Three formal addresses are scheduled for the forenoon session, with a discussion period after each one. The afternoon is to be left open for golf and other forms of recreation or relaxation. In the evening the annual banquet will be held with a prominent speaker and entertainment on the bill.

The speakers for the forenoon session and the one for the banquet will be provided by the program committee, J. D. Colyer, Wolverine Tube Co.; E. J. Tweed, Dole Refrigerating Co.; and Herbert Trix, American Injector Co.

ENTERTAINMENT COMMITTEE

The entertainment features will be in charge of a newly appointed entertainment committee composed of Robert Le Baron, Virginia Smelting Co.; Ivan Corcoran, Square D. Co.; and E. J. Tweed, Dole Refrigerating Co. This committee, it has been decided, also will serve in a like capacity at the organization's fall meeting in October and will in addition take charge of the arrangements for the All-Industry Banquet to be held next January in conjunction with the next All-Industry Refrigeration & Air Conditioning Exhibition.

The third day will be devoted to the annual business meeting of the association and to the drawing for priorities and allocation of space in the next All-Industry Refrigeration & Air Conditioning Exhibition.

EXHIBITION PERSONNEL

The personnel of the 1942 Exhibition Committee also was announced his week by Rema President E. A. Vallee, vice president and general sales manager, Automatic Products Co. It includes:

C. H. Benson, The Imperial Brass Mfg. Co.

R. H. Luscombe, Penn Electric Switch Co.

J. W. Hatch, The Bush Mfg. Co.

W. D. Keefe, Fedders Mfg. Co.

R. M. Van Vleet, Cutler-Hammer, Inc.

This committee held its first meeting in Chicago today (March 26) to prepare the announcements for the Show next January, the application forms, rules and regulations, etc. Among the latter will be the arrangements for the drawing and assignment of show spaces, to take place during the French Lick meeting in May.

EXPECT LARGER SHOW

The Directors already have authorized the Exhibition Commitee to lay out the exhibition hall in two sections—one in the lower hall where a new floor plan probably will be adopted and one on the mezzanine floor and in the Boulevard Room where more space will be used than was provided for the Show this past January. Present indications point to an even larger show a year hence than was held this past January with probably about the same number of exhibitors and booths in each of the two sections or floors.

The Board also has approved a number of additional committee appointments including K. B. Thorndike, Detroit Lubricator Co.; L. F. Blough, White-Rogers Co.; and H. A. Chandler, McIntire Connector Co. to the nominating committee headed by H. V. Higley, Ansul Chemical Co. and on which E. W. McGovern, E. I. du Pont de Nemours & Co., also holds membership.

President Vallee, National Councillor to the U. S. Chamber of Commerce and W. C. Allen, vice president, Modern Equipment Corp., have been delegated to represent Rema at the coming annual meeting of the National Chamber in Washington April 29-May 1.

F-M Has Largest Profit Since 1925

CHICAGO — With a profit of $2,749,679 for 1940, Fairbanks, Morse & Co. reported its largest earnings since 1925. This was equal to $4.59 a share, compared with $4.12 a share earned in 1939.

Amana Society Loses Offices In Fire

AMANA, Iowa—Main plant of the Refrigeration Division of Amana Society was not affected by the fire which destroyed the office building of the organization a fortnight ago, reports George Foerstner, manager. The plant in which Amana refrigerated cases are being manufactured is located about two miles from the scene of the fire, and production there is going on as usual.

A number of inquiries have been received as a result of advertising in AIR CONDITIONING & REFRIGERATION NEWS, Mr. Foerstner said, and it is possible that some of these were destroyed in the office building fire. Readers who may have written the company and received no reply are requested to send their names and addresses again to Amana Society. New literature will soon be available on Amana plug-in cases, display cases, reach-in and walk-in units, and delicatessen and dairy cases, reports Mr. Foerstner.

Kelvinator Pushes Growing Trend To Higher-Priced Units

DETROIT—Anticipating that this spring may be the largest single selling season in the history of the electric refrigerator industry, Kelvinator has launched an intensive spring promotional campaign built around a series of eye-catching store and window displays and an enlarged program of newspaper, national magazine, and radio advertising.

Carload orders from retailers are running more than double those of a year ago, reports Frank R. Pierce, general sales manager, with the percentage of dealer sales of models retailing about $150 more than 33% over 1940 results. This trend toward higher-priced models will gain further momentum during the spring, Mr. Pierce believes, since consumer buying power will be considerably increased by that time.

Sales of "Moist-Master" models are now accounting for more than 20% of all Kelvinator volume, he declared.

For dressing up windows and stores, Kelvinator is making available to dealers a variety of display materials, including an animated "Wise Old Owl" window display, special window trim and banners, special price tags, and two new neon signs. Three-unit and single-unit floor displays also are available.

Knoxville Sales Up 25% In February

KNOXVILLE, Tenn.—Sales of 257 household electric refrigerators were reported by local dealers for February, compared with 209 units sold during the corresponding month last year, according to statistics compiled by the Knoxville Electric Power & Water Board.

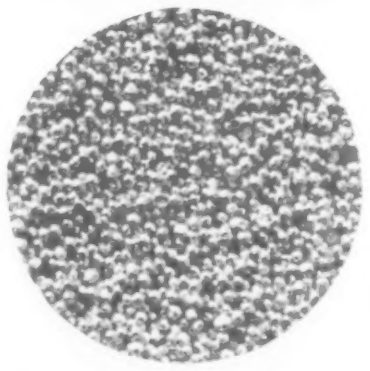
Average unit price of these refrigerators, however, dropped from $165 in February, 1940 to $148 in February of this year.

Appliance	No. of Units	Sales Price
Household		
Refrigerators	257	$148
Ranges	155	144
Water Heaters	51	74
Commercial		
Refrigerators	3	192

4 States Over 20,000 Mark In February

States and Territories	Household Low Sides February	Cumulative
Alabama	4,833	8,782
Arizona	1,516	2,947
Arkansas	2,060	5,357
California	20,617	49,124
Colorado	3,378	5,542
Connecticut	7,151	14,262
Delaware	635	1,226
District of Columbia	2,171	5,031
Florida	4,229	8,468
Georgia	5,720	9,629
Idaho	1,483	3,378
Illinois	26,756	54,206
Indiana	9,245	19,837
Iowa	7,215	14,547
Kansas	3,437	6,977
Kentucky	4,839	9,433
Louisiana	3,388	7,443
Maine	1,843	3,195
Maryland	4,533	8,496
Massachusetts	11,802	25,237
Michigan	17,069	35,129
Minnesota	11,383	19,614
Mississippi	1,917	4,316
Missouri	8,460	18,899
Montana	1,005	2,377
Nebraska	2,850	5,302
Nevada	486	898
New Hampshire	927	2,155
New Jersey	13,953	27,513
New Mexico	963	1,481
New York	28,359	58,099
North Carolina	7,847	14,597
North Dakota	650	1,219
Ohio	19,224	43,100
Oklahoma	3,750	8,740
Oregon	4,802	8,111
Pennsylvania	27,017	56,256
Rhode Island	2,914	5,113
South Carolina	4,074	7,281
South Dakota	1,136	1,941
Tennessee	5,544	11,269
Texas	13,861	28,929
Utah	1,893	3,904
Vermont	640	1,409
Virginia	6,836	11,936
Washington	5,959	14,157
West Virginia	3,972	6,573
Wisconsin	8,584	18,817
Wyoming	409	932
Total United States	**333,335**	**683,236**
Canada	4,255	8,618
Other Foreign (Incl. U. S. Possessions)	9,747	19,041
Total for World	**347,337**	**710,895**

LABYRINTH FILTRATION



A revolution in Filtering Efficiency.

100% Filtering Area Reduced Pressure Drop with the new

Aminco Suredry Dehydrator

The new Aminco Suredry Dehydrator, made with a one piece copper shell, and filled with Silica Gel, uses a new principle of filtration, providing 100% filtering area as compared to 30% supplied by other types.

No constriction or impediment to flow of refrigerants through dehydrating agents.

No clogging with anchoring materials.

No joints or threads to cause pockets or leaks.

Permanent or Re-fillable models available.

Send for Bulletin 23 for complete details of this new development in filtering and dehydrating efficiency.

AMERICAN INJECTOR COMPANY

1481 Fourteenth Avenue DETROIT, MICHIGAN

Pacific Coast: Van D. Clothier, 1015 E. 16th, Los Angeles, Calif.

Export: Borg-Warner International Corp., 310 S. Michigan Ave., Chicago, Ill.

The Truth About Today's Refrigerators !

NO matter what reliable make of electric refrigerator any family chooses today, they'll get more value for their dollars than ever.

For today's good electrical refrigerators are as fine an example of mechanical perfection as human ingenuity, skill, science and experience have produced. They're more than twice as efficient as the refrigerators of ten years ago, yet cost about one-half as much—so little that almost every family can afford the best in modern refrigeration.

So this year, General Electric's message to refrigerator buyers is simply this: (1) Get a refrigerator that's big enough; too many of the early purchasers have wished for more storage space. (2) Get a refrigerator that's completely equipped—for the little conveniences become very, very important multiplied over the years of use. (3) Get a refrigerator that's made by a reputable, experienced manufacturer, for actually it must outwear the mechanical life of many automobiles. (4) Ask neighbors, shop carefully, and get all the facts, for it will be quite a long time before another refrigerator is purchased if today's choice is wisely made. (5) In refrigerators as in most other things, people get what they pay for—so the best model that can be afforded is the best investment.

Naturally we'd like to see people buy a General Electric, for we believe it's the finest machine ever built. Of course, we're prejudiced—but we ask buyers to be sure to look at G-E before making a decision.

Maybe we build the G-E Refrigerator so well, because we have had a lot of experience as the largest builder of electrical conveniences. We do know that we offer, in this refrigerator, features tested by time and a mechanism that's just about tops in the engineering world.

G-E was first with an all-steel cabinet—first with the sealed mechanism—first with many other vital improvements. Its record for low cost, dependable service is unsurpassed. And according to recent surveys it is *preferred by more people than any other refrigerator!* A General Electric is priced no higher than other good refrigerators—as little as $119.95* buys a big 6 cu. ft. model. We believe G-E *actually costs less than any other refrigerator over the years!*

*Prices subject to regional differentials and to change without notice.

This simple, straightforward, statement-of-fact advertising instills confidence, not only in General Electric refrigerators, but also in all good refrigerators, and the retailers who sell them. This type of copy is being featured in G-E's 1941 national magazine advertising program.

GENERAL ELECTRIC

Defense Activities

Mechanical Refrigeration Makes Possible Ground Testing In 'Stratosphere' Conditions

DAYTON, Ohio—Testing aircraft engines under conditions encountered in "stratosphere" flying, at altitudes up to 35,000 feet, has been made possible by the construction of testing laboratories now being completed by the Army Air Corps at Wright Field here. York refrigerating machines are used to create temperatures down to 67° F. below zero.

At 35,000 feet above sea level, air temperature is 67° F. below zero and atmospheric pressure is 4 lbs. per sq. in. absolute, as compared with 15.7 lbs. pressure which prevails on the ground.

Stratospheric low pressure conditions can be simulated by throttling the carburetor supply air to the engine, and exhausting the engine into a vacuum. The refrigerating machines are used to cool the carburetor supply air down to a minimum of 67° F. below zero and the gasoline supply to 0° F.

The evaporators which reduce the gasoline temperature to zero are three York horizontal, shell-and-tube coolers, each capable of handling the full load alone. Refrigeration is provided from an 8 x 8 ammonia compressor.

On the cooling system for the carburetor supply air, army requirements called for an installation of great flexibility of operation, designed for widely varying load conditions.

The system must be able to cool huge quantities of air to a minimum temperature of minus 67° F., operating with any inlet air temperature from maximum down to minus 10° F. Further, air quantities cooled may vary over a wide range. To provide this flexibility York engineers designed a three-stage air cooling system.

In the three-stage system a separate set of ammonia compressors operate on each of three separate evaporators, with all the compressors discharging into a common condensing system.

In the first stage the air is cooled from 100° to 35° F. This is done in a spiral-finned coil evaporator, containing water sprays, connected to an 11½ by 10 ammonia machine operating at 45 lbs. suction pressure.

In the second stage the air is cooled from 35° to minus 13° F. The evaporator is identical to that of the first stage except that a solution of ethylene glycol is sprayed over the coils instead of water. The ethylene glycol prevents frost accumulation to maintain high evaporator efficiency.

The moisture picked up by the solution is boiled off in a "concentrator" before re-spraying. One 10 x 10 ammonia, four-cylinder compressor and one 11½ by 10 four-cylinder machine supplies refrigeration at 3 lbs. suction pressure.

To cool the air down to minus 67° F. after leaving the second stage, eight nests of trombone coils are arranged in an air tunnel, to provide progressive cooling at minus 77° F. evaporator temperature. One 10 x 7½ two-cylinder and two 15 x 10 four-cylinder ammonia booster compressors draw the ammonia vapors from the trombone coils and discharge it at higher suction pressure through intercooling equipment into the second-stage suction lines.

The entire casing surrounding the three air stages is air-tight and thoroughly insulated with cork. A fan located between the second and third stages pulls air through the first two stages and pushes it through the third, so that the air is delivered at the end of the third stage at minus 67° F. and at atmospheric pressure.

At this point secondary fans pick up the air and distribute it through heavily insulated ductwork to the separate airplane engine testing rooms, one or all of which may be in use at any given time.

The third wind tunnel is divided into two sections so that hot gas may be used to defrost one-half of the tunnel while the other is still operating. No defrosting is necessary in the first and second stages.

The common condensing system consists of two horizontal shell-and-tube condensers, into which all the ammonia compressors discharge; the boosters discharge indirectly through the second-stage compressors. After condensing, the liquid ammonia goes directly to each of the three evaporators, passing through an intercooler in stage three.

Extremely low temperatures to which the air is reduced before going into the engine testing rooms precipitate most of the moisture from the air, thus simulating the dry air conditions which exist at high altitudes. Because it may be desirable to raise the temperature of this extremely dry air after moisture precipitation in the cooling process, individually controlled re-heaters are located at the air inlet in each of the four engine testing rooms.

The reheaters are standard copper finned coils, heated by a solution of ethylene glycol.

New Dispensing System Cools Beer In Kegs

ERIE, Pa.—A beer dispensing system designed for use by establishments where cooling of draft beer to serving temperature can be accomplished in the barrel has been announced by Uniflow Mfg. Co. here.

Known as the "Uni-Bar," this system is claimed to provide faster cooling of kegs, fingertip temperature control, minimum tapping and cleaning waste, easy tapping of kegs, and serving of beer direct from kegs without coils.

The Uni-Bar is available for underbar installations or as a bar unit complete with bar top. Both types feature sectional units for two, three, or four-keg storage, and for either remote condensing unit installation or with condensing unit and/or air pump combined with the power unit.

Power unit and workboard can be furnished as a single cabinet. Two beer faucets and one cold water faucet are standard on all models. Bar top models are available with extra long bar tops and panel to include Uniflow "Dry-Cold" bottled beverage coolers.

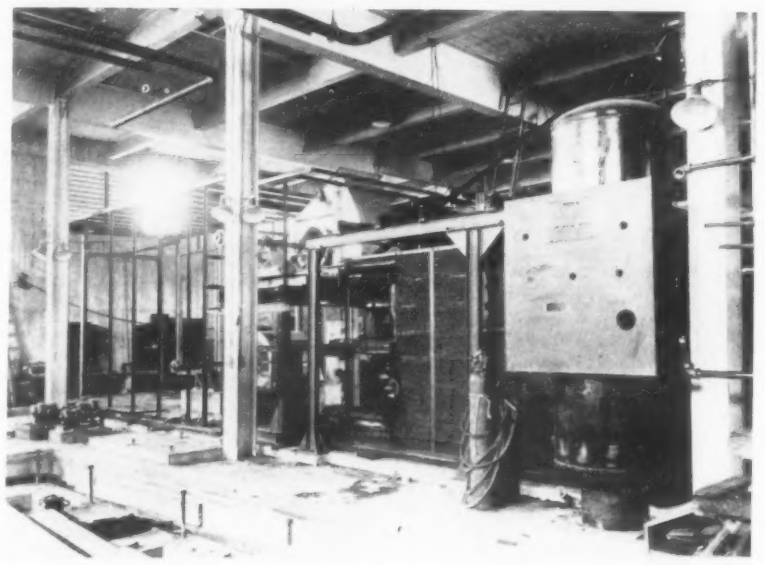
'Angle Meter' Developed For Sheet Metal Men

NEW YORK CITY—The Angle Meter, characterized as "a slide rule for the welding and sheet metal industry," has been announced by Interstate Sales Co. here. Made in pocket size, the Angle Meter was developed to furnish a means by which the man on the job can lay out any angle from 0° to 90° directly on the pipe or flat material.

Using a method of measuring in both directions from a center line, it requires only four measurements to mark a pipe or stretch out in 16 different points on the circumference, it is claimed. Measurements are taken from a movable pointer on a special scale.

FIRST AGAIN
The New Bush Plasti-Cooler . . . first application of plastics to the low-side field.
BUSH MFG. CO.
HARTFORD, CONN.
610 N. OAKLEY BLVD.
CHICAGO
Bush Mfg. Co.
COMMERCIAL COOLING UNITS

35,000 Feet Up—Still on the Ground



Picture taken during the construction of the three air-cooling stage compartments at the Wright Field airplane engine testing laboratory, Dayton, Ohio. On the left is the framework of the first and second air cooling stages. Fans are visible in the center. On the right is the low pressure ammonia receiver for the third stage, and directly behind it, the one end of the third stage wind tunnel. The system will cool huge quantities of air to a minimum temperature of —67° F.

Fiberglas To Work Rhode Island Plant

ASHTON, R. I.—Purchase of the Lonsdale Co. mill here to expand production of Fiberglas has been announced by Harold Boeschenstein, president of Owens-Corning Fiberglas Corp.

The company has completed plans to adapt the plant to its needs and install equipment by June 1 to manufacture fibrous glass that later is woven into all-glass tapes and cloths used for a variety of purposes, many of them urgently needed for defense. Several hundred persons will be employed.

Some 15 employes from the Owens-Corning factory in Newark, Ohio, where Fiberglas production is now centered, will come to Ashton to get manufacturing operations under way. The company also has a plant in Corning, N. Y. and general offices are in Toledo.

New plant has approximately 196,000 sq. ft. of floor space, and is located on a four-acre site. It was selected, Mr. Boeschenstein said, because of its nearness to mills that weave the all-glass tapes and cloths, as well as to electrical manufacturers whose needs the plant is primarily intended to serve.

Maryland Bill Would License Vending Units

BALTIMORE—A bill providing for the licensing of coin-operated vending machines, including electrically refrigerated machines for vending soft drinks and ice cream as well as those for vending candies, nuts, and gum, has been introduced in the Maryland state legislature.

Known as Senate Bill No. 28, this bill calls for a licensing fee of $1 for each machine charging 1 cent for merchandise, $5 for each machine charging from 1 to 5 cents, and $10 for each machine charging more than 5 cents.

The bill further provides that in cases where the same machine vends more than one type or brand of article, the basis of the fee shall be determined by adding the number of cents required to purchase each type or brand sold.

Licensees shall be provided with metal tags or stamps to be affixed to each machine in accordance with the regulations of the State Comptroller, according to the provisions of the bill, and all licenses shall expire on April 13 each year.

In addition, the bill states that the license required shall apply to manufacturers as well as others operating such vending machines and that any person or firm operating or maintaining such a machine without a license shall be guilty of a misdemeanor, and upon conviction thereof shall be fined not exceeding $100.

Final paragraph of the bill reads: "And be it further enacted, that this Act is hereby declared to be an emergency law, necessary for the immediate preservation of the public health and safety. . . ."

Ships on Latin American Run Get Air Cooling

CHESTER, Pa.—Installation of a 160-ton central air conditioning system in the S. S. Rio de la Plata, third of the completely air conditioned passenger-cargo vessels to be launched at the Sun Shipbuilding & Drydock Co. here for the Moore-McCormack lines, has been completed.

Just as in its sister ships, all passenger cabins as well as all public rooms of the 17,500-ton Rio de la Plata will be provided with year-around air conditioning.

The central station Carrier system will supply cooling in summer and heating in winter to the 76 staterooms, each of which is equipped with an individual Carrier "Weathermaster" unit. An automatic dial attachment on each unit will make it possible for passengers to regulate both temperature and humidity in their quarters.

The Rio Hudson and the Rio Parana, which were launched recently, after the Rio de Janeiro, which is scheduled to slide down the ways shortly after the Rio de la Plata, are the other air conditioned ships which will carry both passengers and cargo between the Atlantic coast of the United States and South America.

New Plastics Line Termed Aluminum Substitute

NEW YORK CITY—Designed for use as a substitute for aluminum being withdrawn from commercial fields due to priority demands of the national defense program, a new line of plastic products under the trade names "Plastikmould" and "Plastiktrim" has been introduced by R. D. Werner Co., Inc., finisher of extruded metal moulding.

These new plastic products are manufactured in a wide range of colors in similar shapes and sizes as now supplied in aluminum, and in rods, tubes, and other items both flexible and rigid.

P. C. Goodspeed, who has had many years' experience with plastics, is in charge of plastics production.

Balcony Appliance Display Features Remodeled Store

CAMDEN, Ark.—Major appliances of the Snow Hardware Co., Westinghouse dealer, are now displayed on the balcony following complete remodeling of the store. Small appliances are displayed on the main floor as traffic builders.

Williams Awarded Contract For Device Controlling Gunfire

BLOOMINGTON, Ill.—Williams Oil-O-Matic Heating Corp. has been awarded a national defense contract by the War Department covering the manufacture of a special hydraulic control device for artillery fire. It is an entirely new unit developed for U. S. Army use, and only one of two plants besides Oil-O-Matic will figure in its production.

Williams Oil-O-Matic officials say the contract amounts to between $1,500,000 and $2,000,000. This includes tooling which will cost around $100,000. Blueprints for the first tools have been released.

The first of some 300 parts making up the device will be turned out during the forepart of April, and production on the last part will be underway by June. At that time, an extra shift of workers may be added to the two shifts now on the Williams payroll.

The plant will be sealed by the War Department in April, safety measures being designed to prevent sabotage, and being in line with precautions which have been taken for the past month or so, according to Army officials.

Defense contract will not interfere with normal production by Williams Oil-O-Matic, reports W. A. Matheson, president of the company. Production schedule has been geared to assimilate both defense needs and an increased oil burner production for this and next year, he declares.

Westinghouse Makes Field X-Ray Unit

EAST PITTSBURGH, Pa.—The fastest field X-ray unit of its kind in the world, which will enable the U. S. Army to examine wounded soldiers at the rate of one every minute, is being built by Westinghouse.

The new unit is designed to locate the position of bullets and shell fragments in injured men isolated from hospital facilities. A large number of the machines are now being produced for the Army and will be shipped to major posts throughout the United States and possessions. A sufficient number of machines to provide emergency facilities for the entire army in event of war may be ordered later.

The portable X-ray equipment can be erected in 10 minutes on a battlefield, and is adaptable for almost all types of X-ray studies, though it is designed particularly for direct studies without the need of films.

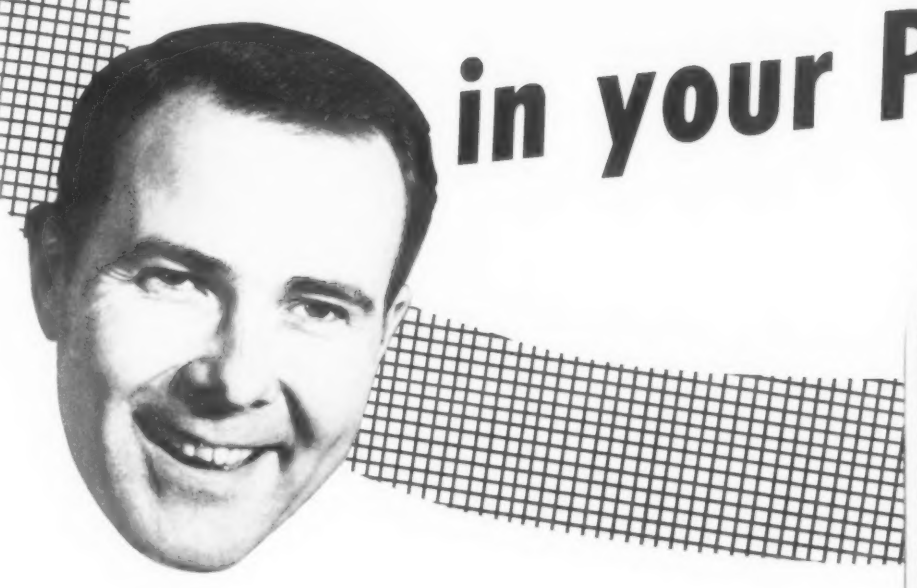
The exact point at which a bullet has entered the body of a patient and the depth to which it has penetrated can both be determined in a 60-second examination.

PROTECTION
from Keg to Faucet
WITH CHIL-KWIK
★ Refrigerated
FLEX-LINE
BEER LINE ASSEMBLY
Alert refrigeration men find a large, profitable market for CHIL-KWIK "Flex-Line" (patents pending)—the flexible, refrigerated beer line assembly. This exclusive one-package item is badly needed in every tavern having remote storage—gives complete temperature protection between keg and faucet. Comes in convenient stock sizes or can be tailor-made to fit without cutting or adjusting.
Dealers and distributors wanted. Cash in on this great opportunity—write for details about CHIL-KWIK "Flex-Line" today!
CHILL-QUICK CORPORATION
325 E. Chicago St., Milwaukee, Wis.
CHIL KWIK

SERVEL
COMMERCIAL REFRIGERATING MACHINES

Servel's 4-cylinder 2-HP machine unit . . . one of 28 models in the complete line.
Whether your requirements are large or small, standard or special, Servel engineers can help you solve your most vexing problems of commercial refrigeration or air conditioning. Write today to Servel, Inc., Electric Refrigeration and Air Conditioning Division, Evansville, Ind.

Put *this difference* in your PROFIT COLUMN!



Exclusive

TRUE-TEMP CONTROL

...makes Westinghouse DIFFERENT

...makes Westinghouse EASIER TO SELL AT YOUR FULL PROFIT

"Hottest selling feature in years," say Westinghouse Dealers of new TRUE-TEMP CONTROL. And it *is* a "natural" for profitable selling—first, because it's a feature that women want; second, it's *exclusive* with Westinghouse.

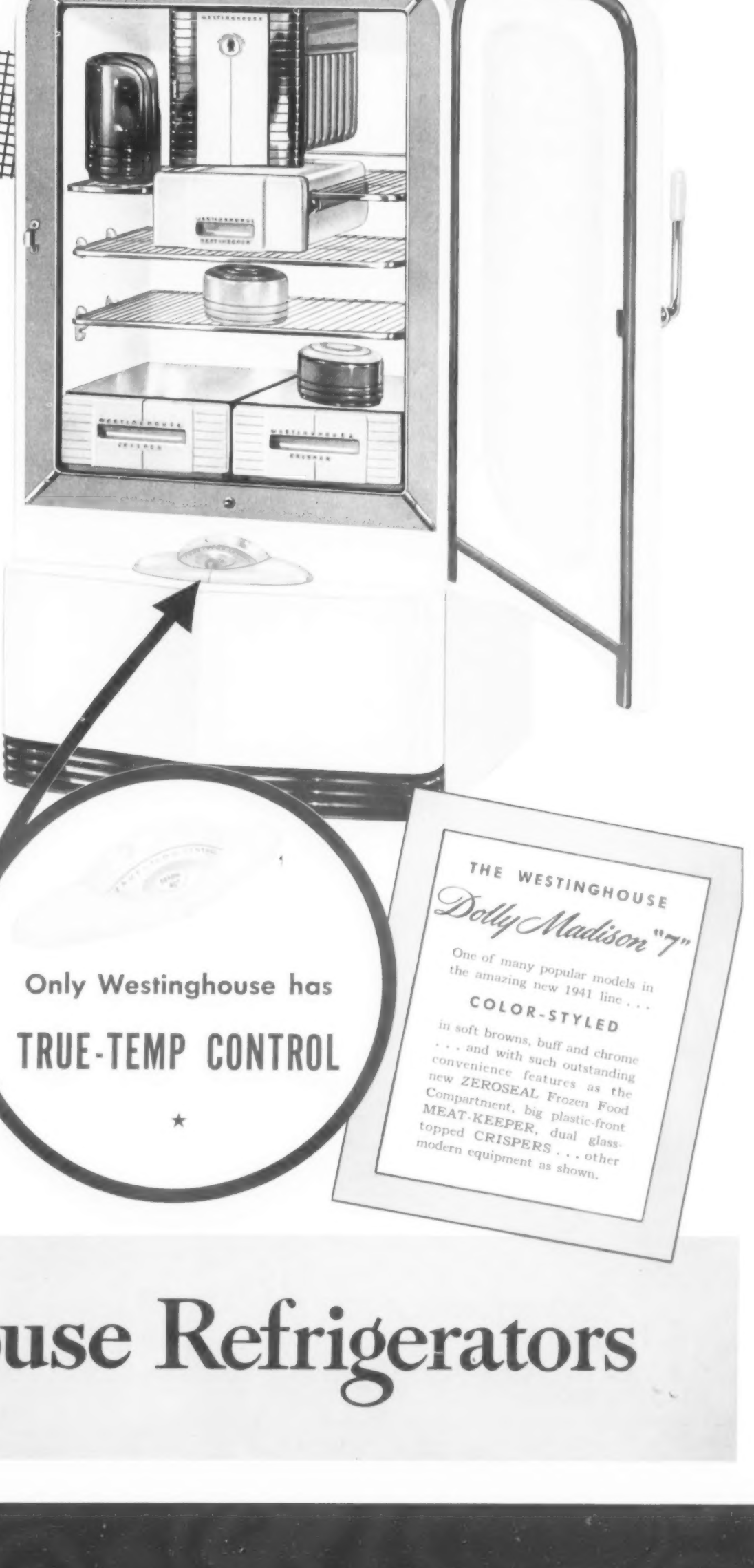
Only Westinghouse TRUE-TEMP CONTROL permits users to dial the exact amount of cold they want . . . *in actual degrees*. And only TRUE-TEMP provides steady, *balanced* cold, under all home conditions—because it's controlled *not from the froster*, but from the food compartment. *That's* the BIG DIFFERENCE!

Super Market

REFRIGERATION

. . made possible by exclusive TRUE-TEMP CONTROL. This gives Westinghouse Owners *five separate conditions* of cold and humidity for their five kinds of food. And it's *steady* cold at all times — *that*, again, is the BIG DIFFERENCE.

WESTINGHOUSE ELECTRIC & MFG. CO.
Dept. 1107 Mansfield, Ohio


Only Westinghouse has
TRUE-TEMP CONTROL
★
THE WESTINGHOUSE
Dolly Madison "7"
One of many popular models in the amazing new 1941 line . . .
COLOR-STYLED
in soft browns, buff and chrome . . . and with such outstanding convenience features as the new ZEROSEAL Frozen Food Compartment, big plastic-front MEAT-KEEPER, dual glass-topped CRISPERS . . . other modern equipment as shown.

Westinghouse Refrigerators

High Fixed Expense Ratio Greatest 'Hidden Danger' To Dealer Profits

By Arthur Roberts

Editor's Note: This is the second article by Mr. Roberts discussing matters of control over financial operating factors by refrigeration dealers.

The first article, in the March 12 issue, explained the advantages of a budget and suggested how one might be set up. This article discusses expense control, especially the vital factor of the ratio of variable to fixed expenses.

"Here's one for Ripley," said Fred Marsh, refrigeration and air conditioning dealer, when I dropped in to see him the other day. John Terry, who runs a home appliance and air conditioning store in the next town, was there. He and Marsh are great pals and compare their business experiences periodically.

Marsh went on to tell me that:

"Terry runs a business similar to mine and has the same class of trade. We carry the same lines and get equally profitable prices. In 1939, Terry did $60,000 in sales. I did $60,800, so we were neck-and-neck on yearly volume. Our costs and overhead expenses were about the same, so our net profits varied only $15.

"In 1940, two large plants in the territory moved away. That hurt local business and John's sales dropped to $50,400 while mine tumbled to $50,700, so we were still running neck-and-neck in 1940.

"Now here's the payoff. In 1939, my net profit was $15 more than John's. In 1940, when we again experienced a similar sales volume, John's net profit was $3,228, my net profit was $1,137, giving John Terry an increase of $2,091. Can you figure it out?"

Such similarity of figures in the same territory isn't so unusual to be "one for Ripley," neither is a wide variation in net profit between refrigeration and air conditioning dealers with almost identical set-ups and sales. It seldom is brought into sharp focus by word or pen because comparatively few dealers get together and compare notes as Marsh and Terry do.

What was a "one for Ripley" to these dealers is no puzzle to an accountant or commercial counselor. However, it brought up an important phase of expense control that every dealer should watch or it may play havoc with profits.

WHEREIN LIES THE JOKER

The joker lies in the ratio of fixed to variable expenses. Many dealers think that an expense is an expense and although this is correct insofar as the dollar-for-dollar obligation is concerned, there is a big difference between a fixed expense and a variable expense in its effect on profits when sales swing low. Then a high ratio of fixed expense may make it impossible for the best of managements to show a satisfactory profit.

Here are comparative statements covering Marsh's and Terry's operating figures for 1939 and 1940. These statements show with X-ray clarity that the ratio of fixed expenses to variable expenses is an important factor in the successful operation of a refrigeration and air conditioning business.

Notice that in 1939, Marsh's ratio of fixed to variable expense was 2 to 1, or his fixed expenses were twice as many dollars as his variable expenses, whereas, Terry's ratio was just the opposite. His variable expenses were twice his fixed expenses, or a variable to fixed ratio of 2 to 1.

In 1940, Marsh and Terry, sensing the downward trend of sales, began to cut expenses to keep net profits in line. Their fixed expenses were constant and could not be reduced so they had to concentrate on variable expenses: to wit:

Fred Marsh

Total overhead expense, 1939	$21,270
Total overhead expense, 1940	19,143
Decrease—30% of $7,090 variable expense	$ 2,127

John Terry

Total overhead expense, 1939	$21,165
Total overhead expense, 1940	$16,932
Decrease—30% of $14,110 variable expense	$ 4,233

Both dealers cut their variable expenses 30%, indicating that they were equally efficient with the nippers but Terry's ratio of variable to fixed expenses enabled him to use expense control more effectively.

CAN'T CUT WHEN NECESSARY

Marsh's proportion of variable expenses was too low. Even though he cut close, his efforts were stymied by the high ratio of fixed expense, which he couldn't cut. Terry, on the other hand, with a bigger field to work in, $14,110 in variable expenses against Marsh's $7,090, took a grand slam at this portion of his overhead in 1940 and saved $4,233. He may have been able to effect some of this economy in 1939 but some dealers forget their overhead in the years of fat and try to economize only in lean times.

The important thing to remember in this connection is that you should never let your fixed expense loom so high in ratio to variable expense that you can't effect satisfactory economies if sales veer off.

I have known cases where the ratio of fixed to variable expense ran 8 to 1 without serious effect on profits when sales were in high but when sales tumbled, a wipe-out of the entire variable expense, all the reduction it was possible to make, would not prevent an operating loss.

TOUGH TO UNLOAD

Undue expansion will sometimes skyrocket fixed expenses haphazardly and explains why some manufacturers are not too keen about expanding these days because the fixed charges that expansion brings with it, cannot be discarded when sales tailspin. The same holds true for all business enterprises.

If you load yourself up too heavily with fixed expenses when business skyrockets, you may not be able to get out from under when it resumes a normal trend or dips below normal. This does not mean that you should throttle reasonable expansion but consider all circumstances carefully before obligating yourself to carry fixed expenses that you can't cut because they cannot be discarded as readily as variable expenses.

WHAT ARE FIXED EXPENSES

Items usually classified as fixed expenses are:

Rent
Depreciation
Taxes
Insurance
Interest on long-term loans and mortgages
Heat, light, power, water
Allowance for bad debts.

WHAT ARE VARIABLE

Items usually classified as variable expenses are:

Salaries of executives, salesmen, and other employes
Bonuses and commissions
Office expense
General supplies
Advertising
Maintenance and repairs
Unproductive labor
Incoming freight, express, and cartage
Legal and accounting services
Travel, dues, subscriptions, donations
Telephone and telegraph
Delivery expense
Interest on short-term borrowings
Miscellaneous expense, such as credit report fees, petty cash items, loss on inventory, etc.

There is no standard ratio against which to check your proportion of fixed to variable expenses. In the refrigeration and air conditioning retail field, my studies show that the fixed to variable ratio gyrates from 1 to 2½ to 1 to 6. You will naturally ask:

"If the ratio varies rather inconsistently with sales and profits, what policy shall I pursue in checking this important factor in expense control?"

A SUGGESTED RATIO

I would suggest that you try to maintain a ratio of at least 3 variable to 1 fixed, that you "eagle-eye" variable expenses at all times to keep them at minimum, that you refrain from saddling your business with a fixed expense unless you have considered all circumstances carefully, that you list fixed and variable expenses on your profit and loss statement separately so that the two classifications will stand out in bold relief for comparative study from month to month or period to period.

A change in the ratio need not mean disaster, in fact, it may be for betterment, nevertheless, this ratio should be watched and any change probed immediately.

It should not be difficult to make sales during the next few years, but it will be difficult to salvage profits on the sales made unless you maintain top standards of efficiency on expense control and one way to accomplish this objective is to see that fixed and variable expenses are safely proportioned so that, unlike Fred Marsh, you do not go under with overhead.

How Expense Ratios Work on Profit Picture

1939 Fred Marsh	
Sales	$60,800
Cost of sales	36,480
Margin on sales	$24,320
Overhead expenses	
Fixed expense	$14,180 (2)
Variable expense	7,090 (1)
Total overhead expense	$21,270
Net profit on sales	**$ 3,050**
1940	
Sales	$50,700
Cost of sales	30,420
Margin on sales	$20,280
Overhead expenses	
Fixed expenses	$14,180
Variable expenses	4,963
Total overhead expense	$19,143
Net profit on sales	**$ 1,137**

1939 John Terry	
Sales	$60,500
Cost of sales	36,300
Margin on sales	$24,200
Overhead expenses	
Fixed expense	$ 7,055 (1)
Variable expense	14,110 (2)
Total overhead expense	$21,165
Net profit on sales	**$ 3,035**
1940	
Sales	$50,400
Cost of sales	30,240
Margin on sales	$20,160
Overhead expenses	
Fixed expenses	$7,055
Variable expenses	9,877
Total overhead expense	$16,932
Net profit on sales	**$ 3,228**

This Watchman Can Now Talk 'Cold Turkey'

EAST HOMER, N. Y.—Although he occupies a small, isolated cabin on the turkey run, Cecil Thayer, night watchman for Atkinson Bros.' farm where thousands of turkeys are raised, enjoys the benefits of modern food preservation with his new 6-foot Westinghouse refrigerator.

Last year each of the Atkinson brothers bought a new refrigerator, and when Mr. Thayer recently saw these, he ordered one for himself. Now he's trying to dispose of his discarded ice box.

'Don't Pull the Shade' Is Theme of G-E's Vacuum Program

BRIDGEPORT, Conn.—"Don't pull down the shade!" on dealer displays, on local advertising, and on promotions keyed to definite buying groups is the theme of General Electric's 1941 program for vacuum cleaners.

This year's cleaner line consists of five floor type cleaners with motor-driven brush, two tank type cleaners, and four hand cleaners, one of which is sold only in combination with a matching floor cleaner. There are also two sets of attachments, priced at $9.95 and $12.95.

Recommended list prices on the floor cleaners range from $29.95 to $54.50, on the tank cleaners from $39.95 to $59.95, and on the hand cleaners from $14.95 to $19.95.

The 1941 line was built and priced to fit the needs of three classes of retailers, explained A. L. Atkinson, manager of the cleaner section. Specialty appliance dealers, who can sell deluxe equipment, comprise the first class. In the second class are most other retailers, for whom the combination offers have been devised. The third group consists of department and furniture stores, or syndicate buyers, where price appeal is paramount.

National magazine advertising on cleaners alone, as well as participation in G-E full-line copy, will be continued.

Available promotion materials include prospect presentations, direct mail campaigns, broadsides, folders, and display cards. Among the new displays is one designed to hold a floor cleaner, tank cleaner, and set of attachments. It combines a glass case of the jewelry store type for attachments, a display drape background on which a bare floor tool emphasizes the all-purpose character of the tank cleaner, and a mirror arrangement to reflect the action of the brush in the floor cleaner.

Birmingham Sales Up 1,200 Units In 1940

BIRMINGHAM, Ala.—Electric refrigerators continued as the leading revenue-producer for Birmingham electrical appliance dealers during 1940, but lower prices kept dollar volume from matching the proportion of the year's gains in unit sales, according to dealers to Birmingham Electric Co.

Refrigerator sales during 1940 totaled 7,910 units, compared to 6,710 in 1939, but dollar volume rose only to $1,376,800, compared to $1,174,250 during the preceding year. Decrease in unit-sale value of products was especially noticeable in radios, where sales went up in 1940 to 23,867 units, compared to 21,435 in 1939, but dollar volume dropped to $937,520 from a prior-year mark of $1,071,750.

Electric ranges, water heaters, and stokers showed the highest percentage of increase during the year, with range sales jumping from 962 to 1,152 units, water heaters from 110 to 267 units, and stokers from 994 to 1,265 units.

In the commercial field, refrigeration sales increased from 661 units in 1939 to 972 units last year, but volume rose only from $203,291 to $227,486. Air conditioning sales were down from 1939 totals, sales totaling 21 units, compared to 42.

What Associations Can Legally Do Is Indicated In Decree

WASHINGTON, D. C.—The fog of uncertainty surrounding certain business practices which has so long plagued many manufacturing concerns was partially dispelled in the consent decree recently entered into by electrical connector producers and the U. S. Department of Justice.

Nine manufacturers, their Trade Institute, and Frank H. Baxter Associates, of New York City, signed the decree.

In general the decree enjoins all the signatories from entering into any program or other artificial arrangement to "raise, depress, establish, maintain, or adhere to prices to be charged" or conferring for such purposes, but permits a number of business practices which will have wide-spread benefit to all industries.

These include the collection and dissemination of reports on consummated sales and prices obtained, the auditing of industrial statistics to insure completeness and accuracy, and the issuance and circulation of prices, terms, and conditions of sale if such information is "readily, fully, and fairly available to the purchasing and distributing trade" at the time of their initial dissemination.

Also nothing contained in the decree shall be construed to prohibit lawful conduct of one or more of the signatories authorized or permitted under the patent laws, though the government properly retains its right to institute action alleging the use of patents in violation of the anti-trust statutes.

"Evidencing further desirability to proceed legally in all phases of their business," said Frank H. Baxter, on behalf of the litigants "the manufacturers who signed the decree agree that it shall apply to all commodities they produce, over and above the electrical solderless service connectors to which the court's action is specifically directed."

The business practices which the decree permits include:

"* * * * * reporting, collecting, auditing, compiling, disseminating, or exchanging with any other manufacturer information * * * * * * in actually consummated sales and in bona fide contracts to sell, duly executed and unconditionally binding the seller to sell and the buyer to accept delivery at a certain price."

The decree bans the use of methods involving coercion and duress to compel adherence to plans for the collection and dissemination of statistical information, but provides "that procedures designed and executed solely to give assurance of the completeness and accuracy of data lawfully collected and disseminated shall not per se be deemed to involve elements of coercion."

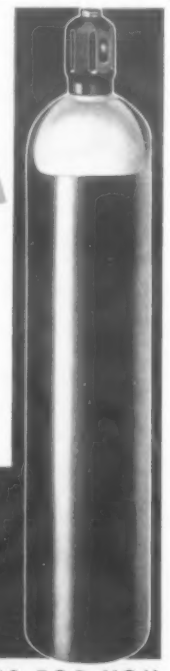
Thus the validity of proper auditing methods in a statistical program of a trade association is officially recognized.

The decree further provides:

"Nothing contained in this decree limits the right of any defendant to issue and circulate his or its current prices, terms and conditions of sale generally applicable to the sale and distribution of said commodity or commodities, provided such lists are made, or are readily, fully, and fairly available to the purchasing and distributing trade at the time of their initial dissemination, and that nothing be done to commit any such defendants to adherence to any such prices, terms, or conditions of sale."

When you do business with an Ansul Jobber you do business with a man who wants to serve you as a friend. He prizes your satisfaction and your good will too highly to regard you only as an account number. *That's* why he's an Ansul Jobber.

Agents for Kinetic's "Freon-12" CA-3-1



ANSUL SULPHUR DIOXIDE
METHYL CHLORIDE
ANSUL ICE-X

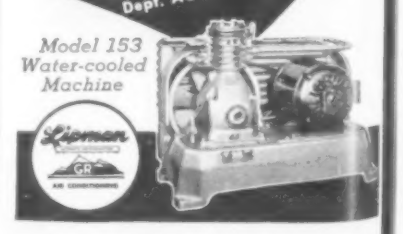
ANSUL CHEMICAL COMPANY . MARINETTE, WISCONSIN

THE JOBBER WHO WORKS FOR ANSUL WORKS FOR YOU

The Machine For Your Next Job...

If it's a refrigeration job ...no matter how big or how small...we can supply Lipman equipment to fit the specifications. *Let us work with you.*

GENERAL REFRIGERATION DIVISION
Yates-American Machine Co.
Dept. AC-3, Beloit, Wis.



Model 153 Water-cooled Machine

Lipman

MEMO TO SERVICE MEN!
● Every once in a while, some sensational improvement comes along that means an important saving of time and money in service operation, and also does a better job. We're sure that when you investigate the new and exclusive Frigidaire Modulex Expansion Valve you'll find it's one of the most outstanding of such improvements in some time.
Service Sales Department
Frigidaire Division, General Motors Sales Corporation
Dayton, Ohio

Sensationally New

FRIGIDAIRE Precision-Built MODULEX VALVE

Four Reasons why no other expansion valve matches it!

1 May be installed in any place—in any position!

Hermetically sealed from all moisture. Solves installation difficulties of ordinary expansion valves. Saves time on every installation!

2 Reduces Suction Pressure Surging!

This valve gets its name, "Modulex," from this advantage—from its modulating control of the refrigerant. Because this valve tends to keep the evaporator filled with refrigerant, it increases the efficiency of the evaporator and more even temperatures can be maintained.

3 Lowest Price in Frigidaire history!

All the advantages you've been looking for in refrigerant control—and all at an amazing low price, the lowest in Frigidaire history for a comparable valve! Don't fail to investigate for your installations.

4 Small—Vest Pocket Size!

From top to bottom it's only $3\frac{5}{8}$". Greatest width at any point is only $3\frac{7}{16}$"—and it's only $1\frac{3}{8}$" inches thick. Carry it in your vest pocket if you want to. Overall weight only 14 ounces!

● Only Frigidaire offers you these advantages in an expansion valve—the advantages you've long been looking for. In fact, if you'd written the specifications yourself, you wouldn't have designed a valve to better solve your refrigerant control problems than this sensational new Frigidaire Modulex Expansion Valve.

Now, when you install an expansion valve you don't have to work with a clumsy, expensive, hard-to-handle valve that must be placed in just the right position to provide even satisfactory refrigerant control. No. You simply install Frigidaire's new low-cost, vest pocket size Modulex Valve, *wherever it's most convenient!* And after it's installed... don't worry about its performance.

This new valve is built with the same precision and quality workmanship as the world-famous Frigidaire refrigerator. It's backed by years of Frigidaire and General Motors engineering experience. It's stood the test of time and use in over 2500 installations!

Investigate this sensational new Frigidaire Precision-Built Valve, now! See how much better service you can give your customers, how much time and money you can save with its amazing improvements and low price. Contact your Frigidaire Distributor at once. Mail coupon below, today, for *free* descriptive booklet with full details, including prices.

FROZEN IN A BLOCK OF ICE!

The ONLY vapor-charged Valve which is not affected, in operation, by surrounding temperatures. May be installed in any place, in any position!

Contact YOUR Frigidaire Distributor!

Ohio Edison Co., *Akron, Ohio*
Colonie & Montgomery Sts., *Albany, N. Y.*
675 Greenwood Ave., *Atlanta, Ga.*
Pratt St. & Market Pl., *Baltimore, Md.*
420 N. Broadway, *Billings, Mont.*
600 N. Seventh St., *Birmingham, Ala.*
23-25 Blandford St., *Boston, Mass.*
1100 Main St., *Buffalo, N. Y.*
Merchandise Mart, *Chicago, Ill.*
1729 E. 22nd St., *Cleveland, Ohio*
P. O. Box 1052, *Dayton, Ohio*
1920 Market St., *Denver, Colo.*
824 Mulberry St., *Des Moines, Iowa*
4584 Masbury Grand Ave., *Detroit, Mich.*
500 San Francisco St., *El Paso, Texas*
2615 W. 7th St., *Fort Worth, Texas*
55 E. Washington St., *Hagerstown, Md.*
3104 Main St., *Houston, Texas*
927-31 N. Meridian St., *Indianapolis, Ind.*
212 Michigan Ave. West, *Jackson, Mich.*
2619 McGee Trafficway, *Kansas City, Mo.*
1057 North LaBrea Ave., *Los Angeles, Calif.*
851 E. Broadway, *Louisville, Ky.*
1071 Union Ave., *Memphis, Tenn.*
134 N. W. Third Ave., *Miami, Fla.*
647 West Virginia St., *Milwaukee, Wisc.*
4 Cummins Station, *Nashville, Tenn.*
19 E. Washington St., *New Castle, Pa.*
4436 Toulouse St., *New Orleans, La.*
P. O. Box 300, *Norfolk, Va.*
1250 53rd St., *Oakland, Calif.*
811-13 N. Broadway, *Oklahoma City, Okla.*
2558 Farnam St., *Omaha, Nebr.*
316 S. Jefferson Ave., *Peoria, Ill.*
1920-22 Chestnut St., *Philadelphia, Pa.*
404 Craig St., *Pittsburgh, Pa.*
1015 N. W. Glisan St., *Portland, Ore.*
29 Franklin Road, *Roanoke, Va.*
205 St. Paul St., *Rochester, N. Y.*
3414-28 Lindell Blvd., *St. Louis, Mo.*
2446 University Ave., *St. Paul, Minn.*
579 W. 2nd South St., *Salt Lake City, Utah*
301 S. Flores St., *San Antonio, Texas*
300 West Lake North, *Seattle, Wash.*
806 Pierce St., *Sioux City, Iowa*
320 Riverside St., *Spokane, Wash.*
351-57 E. Onondaga St., *Syracuse, N. Y.*
102 E. Lafayette St., *Tampa, Fla.*
146-48 N. Market St., *Wichita, Kansas*
(Also Toronto, Canada)

GENUINE FRIGIDAIRE PRECISION-BUILT PARTS

Free! DESCRIPTIVE BOOKLET MAIL COUPON TODAY!

FRIGIDAIRE Service Parts Distributor

(Check list above for location of your Frigidaire Distributor)

Gentlemen: Please send me your Free Descriptive Booklet with full details, including prices, of the new Frigidaire Precision-Built Modulex Expansion Valve. I understand there is no obligation.

Name .....

Firm .....

Street Address .....

City and State .....

Los Angeles Firm Specializes In Theater Cooling & Ventilating

Free Advisory Service and Frequent Personal Contact Is Basis of 5-Point Sales Program

LOS ANGELES—Selling air conditioning to theaters has been the business of Air Conditioning Engineering Co. which was established here in 1924. According to Charles O. Fedler, the company has installed ventilating and air conditioning equipment in nearly all Fox theaters built in Southern California, serves three local chain theater owners, and has at least 50% of the independents as customers.

Mr. Fedler has found that in addition to new work, the theater field offers many opportunities for remodeling, as many older houses must buy cooling equipment to be brought up to date. The work also offers a source of leads into allied fields, such as ballrooms, cocktail bars, and restaurants.

From his experience, Mr. Fedler has set down a number of rules which he believes are important in going after the theater cooling business. They are as follows:

HERE'S HOW

First: do not wait until you hear of a building award. Get in on the ground floor by calling on theater owners, both chain and independent, whether you think they need your services or not. Do not try to work through the general contractor, but deal directly with the theater owner.

Mr. Fedler has found that theater managers are fairly closely allied in their work through the film booking agencies, and that "the trade" generally knows what is going on, and what other managers are contemplating.

Second: hold your contacts through consultation and service. Mr. Fedler stands ready at any time to advise theater managers on their ventilating and conditioning problems, whether his firm installed the job or not. In fact, he urges the managers to call on him for "free advice" whenever needed.

The field has many problems, he points out, in heating and ventilating because of the fact that these are tied up so closely with the success of the theater. Comfort of patrons while in the theater stands in a position of primary importance and takes equal rank with the calibre of pictures shown, for no matter how good the pictures may be patrons demand comfort or they will not patronize the house.

For example, one of the largest and newest local houses was built with a large and overhanging balcony. When the air conditioning was turned on the "cold" under this overhang would become so intense that patrons complained—whereas the rest of the house was comfortable. By showing the manager how this problem could be solved, the firm was able to win thanks and establish itself more firmly in the field.

Third: do not depend on direct mail or other forms of advertising. You will never know about such problems as the one above unless you make it a practice to "get around in the trade," to call on the managers constantly, and to be useful in helping them meet their problems.

Fourth: do not try to sell specific equipment. Air Conditioning Engineering Co. does not represent any equipment manufacturer but prefers to leave equipment specifications up to the builder or owner.

Finally: get your price. Price is perhaps less important as a selling point in this field than in any other, because it is a field in which the installation must produce better results than in any other. A store, for example, can have defective equipment and not receive the number of complaints and loss of business that the theater would receive if equipment was not satisfactory, Mr. Fedler asserts.

Indianapolis Cooling Jobs Up 57% In 1940

INDIANAPOLIS — One hundred and twenty-two air conditioning installations were made here during the past year, an increase of 57% over the 1939 figure, according to I. W. Cotton, president of the Air Conditioning Council of Indianapolis. The total connected horsepower reported amounted to 2,835, an increase of 495% over the preceding year.

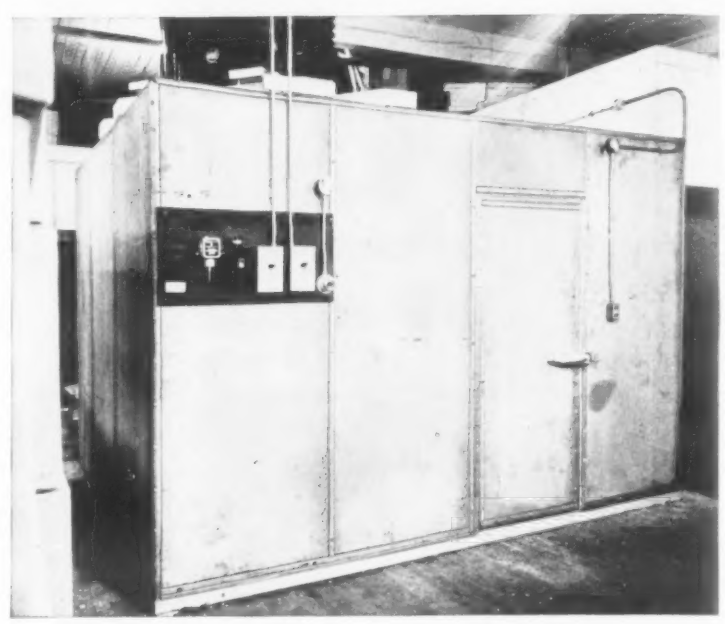
The 1940 installations bring the total of air conditioning installations in Indianapolis to 535, up to the present time, which have 10,342 hp.

Oversize 'Medicine Chest' Cooled To 45° F.

SEATTLE — Vaccines, arsenicals, serums, and other medicinal products are held at 45° F. in the new cold storage room of Abbott Laboratories' local branch, which was constructed of Lindsay Structure. The prefabricated all-steel structure was shipped knocked down for assembly here.

On top of the 12 x 9 x 7-foot chamber is an air cooled York "Freon-12" compressor connected to a forced draft cooling unit within the chamber. Joints of the structure are sealed, and the floor is covered with asphalt to prevent excessive moisture penetration. Interior is covered with 3 inches of Dry-Zero Bound-Batt insulation and finished with lacquered plywood.

Medicinal products stored in the chamber are kept on several rows of steel shelving set out slightly from the walls to permit good air circulation.



This Lindsay Structure cabinet is cooled to 45° F. by a York compressor for storage of medicinal products.

'Steady Progress' In Gas Air Conditioning Reported By A.G.A.

NEW YORK CITY — "Orderly progress in the field of gas summer air conditioning" during the past year is reported by the Joint Committee on Industrial & Commercial Summer Air Conditioning of the American Gas Association. While no spectacular developments in equipment or merchandising have taken place, Charles R. Bellamy, chairman of the committee, reports that several manufacturers have made steady progress in the development of gas fired units for summer air conditioning use.

Bryant Heater Co. has expanded its line of rotary Silica Gel dehumidifying units to include 500, 800, and 1,300 c.f.m. models.

Mills Novelty Co. is experimenting with fifteen or more ammonia absorption systems of a unique new design. These direct fired units have a built in evaporative condenser to conserve water, and while the units are only 2½ tons in capacity, provision has been made for the storage of ice on the evaporator coils to increase this capacity to meet periods of peak operation.

Pittsburgh Lectrodryer continues to offer equipment using Activated Alumina as a direct dehumidifying agent, for special and general application.

Servel, Inc. has continued the development of a unit for year-around air conditioning using water as the refrigerant and lithium chloride as the absorbent. Approximately twenty-five of these units, of residential size, have been manufactured and placed in service during the past year.

Surface Combustion Corp. is now offering lithium chloride dehumidifying units in standard cell capacities of 3,000 and 4,000 c.f.m.

Williams Oil-O-Matic has manufactured 15 absorption units of approximately 35 tons capacity. Eight of these units have been placed in operation in the library at Tulane university.

Mr. Bellamy states that "it can be seen from the foregoing brief description of the offerings of the major manufacturers that the gas industry does not have at hand equipment suitable for mass marketing for summer air conditioning purposes . . . and it is apparent that this equipment can only care for part of the requirements, and, therefore, must be considered as an accessory to the system as a whole."

In discussing the suggestion made in the committee's 1939 report, that the A.G.A. employ a full-time air conditioning expert, Mr. Bellamy says, "In the ever changing and developing air conditioning field, the committee feels that the gas industry needs the services of a qualified full-time observer and counselor to assist in charting the correct course toward a bigger gas summer air conditioning business."

An appendix to the report contains the talk given last year by John deB. Shepard, "Are We Selling Our Industry Short?" which was reported in the June 19, 1940 issue of AIR CONDITIONING & REFRIGERATION NEWS.

Copies of the report are available from the American Gas Association, at 40 cents each.

Do Employes Benefit From Air Cooling? Look At This Survey!

NEW YORK CITY—How air conditioning affects the health, efficiency, and performance of factory, office, and shop workers is summed up in a recent issue of Forbes magazine. Discussing "Air Conditioning Increases Efficiency of Workers," Don Samson utilizes a number of examples which are familiar to readers of AIR CONDITIONING & REFRIGERATION NEWS.

In the plant of the Bulova Watch Co. sweat from workers' brows slowed production. Air conditioning eliminated this problem, together with the expensive drying process that preceded the assembly of watches.

Out of a large number of executives interviewed in an independent survey sponsored by York Ice Machinery Corp. 94.6% said air conditioning increases the efficiency of workers; 77% said it increased the amount of work done; and 93% that it reduced hot weather fatigue.

Out of the employes interviewed in the survey 90% believed that air conditioning helped them do more work on hot days; 94% said air conditioned work is less tiring; and 95.6% that most of their fellow workers liked air conditioning.

Air conditioned offices of the Philadelphia Electric Co. had fewer days lost per 100 employes than in non-air conditioned spaces. Expressed in percentage, the health gains have been as follows:

1932-33	38%
1933-34	30%
1934-35	21%
1935-36	35%
1936-37	7%
1937-38	43%
Six-year average	29%

The Onondaga Pottery Co. reports that "since installing air conditioning," (Carrier centrifugal-1922) "there has been no case of lead poisoning. We attribute this fine record partly to air conditioning, partly to the practice of having the employes drink milk at regular intervals during the day."

At the S. C. Johnson & Co., Inc. wax plant at Racine, an air conditioning system which cost 10 cents per day for each of 250 employes to operate reduced machine errors, and hot weather fatigue. Employes maintained a better appearance and put in more nearly a 100% day.

Proctor & Gamble found, in the company's five-story air conditioned building at Cincinnati, that absences were reduced from 2.2 days per worker per year to 1.6 days.

Absences were reduced by exactly the same percentage in the United Service Automobile Association at San Antonio, Tex.

Output of the drafting department of the Detroit Edison Co. was increased 51% when the department was moved to the company's air conditioned Third St. building, in 1937.

THE ORIGINAL
Velvet Action VALVES
A precision type for every need . . . Thermal Expansion, Constant Pressure, Automatic, Retarder, Defrosto and Check Valves.
Peerless OF AMERICA INC.
Model VL
Midwest Factory, General Offices—515 West 35th Street, Chicago
Branch Offices: New York, Los Angeles, Dallas. Export Div., Detroit

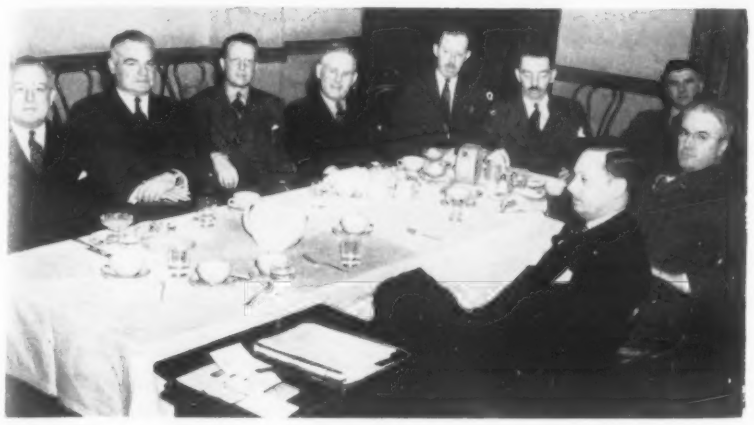
Anaconda Copper Refrigeration Tubes
"Cutting off"—Shown in new booklet—Ask for a copy
ANACONDA
THE AMERICAN BRASS CO.
FRENCH SMALL TUBE BRANCH
General Offices: Waterbury, Conn.

ATTENTION ALL DEALERS!
Investigate
THE NEW ALL AMERICAN ELECTRIC DIRECT DRAW
1. New Sales Appeal.
2. New Design.
3. New Two Tone Finish.
4. New Refrigerated Rods.
5. New Recessed Base.
6. New Popular Prices.
Write for particulars today.
LA CROSSE NOVELTY BOX MFG. COMPANY
LA CROSSE, WISCONSIN

DOLE VACUUM COLD PLATES
Maximum Refrigeration Efficiency
For ICE CREAM CABINETS
SODA FOUNTAINS • BACK BARS
TRUCKS • DISPLAY CASES and WINDOWS
FOOD COUNTERS • LIQUID COOLERS
LOCKER PLANTS and other applications
NEW YORK BRANCH
601 WEST 26th STREET
NEW YORK CITY
FOR COMPLETE INFORMATION AND CATALOGS • WRITE DEPT. A.R.-A41
DOLE REFRIGERATING COMPANY
5910 North Pulaski Road • Chicago, Illinois

Distributor-Dealer Doings

Niagara League Completes Plans for 6-Day Refrigerator-Range Show



Completing plans for the joint Electric Refrigerator and Range Show of the Electric Association of the Niagara Frontier are (starting at extreme left and reading clockwise): General Chairman Roland H. Davison, Kelvinator district manager; Vice Chairman F. L. Riehle, Frigidaire district manager; Vice Chairman Don W. White, G-E Supply Corp.; Floyd Barber, Bergman-Philco Corp.; J. Arthur Apsey; Co-chairman W. S. Schmidt, Buffalo, Niagara Electric Corp.; S. S. Vineberg, association manager; W. L. Sayre, Hotpoint district manager, Clifford Curtiss, Bergman-Norge Corp.

* * *

BUFFALO—A joint Electric Refrigerator and Range Show will be held here April 21 to 26 on the ground floor of the Electric building under sponsorship of the Electric Association of the Niagara Frontier.

The show will be preceded by a Salesmen's Jamboree on April 18 at which plans for the promotion will be outlined. Chairman of the Jamboree, which will feature topnotch merchandising talks and entertainment, will be Roland H. Davison, chairman of the electric refrigeration committee of the association. He will be assisted by Walter S. Schmidt, chairman of the electric range committee.

The joint refrigerator-range show was decided upon for this spring because so many of the refrigerator distributors also handle ranges. Distributors handling ranges or refrigerators alone, however, also will participate in the show. All booths will be of substantially the same size, accommodating six units.

RECORD IS 64,000

In the past, as many as 64,000 persons have attended such shows in the Electric building here. Some 14 distributors are expected to cooperate in this year's project.

The $3,000 budget for the show is raised by booth rentals and contributions from the power company and the association.

The show will be open to the public from 9 a.m. to 9 p.m. daily. The exhibit is primarily a selling show and sales will be made from the floor. A maximum of four salesmen will be allowed in a booth at one time. Salesmen must remain within their booths.

All advertising placed by participating concerns or their dealers on ranges and refrigerators displayed at the show must feature current models at established current list prices. No special discounts, trade-in allowances, nor anything but regular carrying charges are to be advertised during the show. Courtesy cards must not be distributed.

TO STRESS DEALERS

Salesmen are instructed to explain to customers that they are not buying from the Buffalo Niagara Electric Corp. but from the particular dealer making the sale. No sound devices may be employed by distributors.

At the suggestion of Samuel S. Vineberg, manager of the electric association, the week of the show will be known as "Food and Health Preservation Week." Distributors will run cooperative advertising during the week of the show, with the keynote being sounded in a large spread in the Sunday paper preceding opening of the exhibit.

At the same time, the electric association will conduct a vigorous promotion on refrigerators and ranges in connection with the show, using various advertising mediums.

In view of this show, the association decided to forego a sales contest for dealers' salesmen this spring, with the possibility that it may be conducted in the fall.

New Jersey 1940 Sales Top 1939 By 61%

NEWARK, N. J.—Sales of electric refrigerators by distributors and dealers in the northern New Jersey area during 1940 increased 61% over 1939, according to statistics gathered by Essex Electrical League.

J & R Supply Remodels 3 Dallas Stores

DALLAS, Tex.—J & R Motor Supply Co. has remodeled and enlarged the appliance departments of its three local outlets. The firm handles Kelvinator refrigerators.

Cobbs Electric Takes on Hotpoint Appliances

MT. OLIVE, N. C.—Cobbs Electric store here recently added the Hotpoint line of appliances to the Norge line which it already carried.

Cooking Schools Launch Dealers' Spring Drives

OMAHA, Neb.—Spring selling campaigns were launched by two refrigerator dealers here with cooking schools tied in with extra newspaper promotion and window and interior displays.

Union Outfitting Co.'s two-day cooking school was conducted by Mrs. Nellie Burke, Nebraska Power home service advisor, and Mrs. Mary Gordinier, Frigidaire home economist. G-E Supply Co. also cooperated. Lenten and Easter dishes were featured in the demonstrations of 1941 appliances, which were also shown in a special display. Free menus, prizes and gifts, food, and samples helped attract a capacity crowd.

Week-long "kitchen karnival" with Mrs. Vera Cooney, cooking specialist, in charge attracted one of its best crowds in years for Orchard & Wilhelm Co. Some of the demonstrations were in the store windows, while there were two daily radio broadcasts.

McCarthy Conducts Bendix Meetings In Minneapolis

MINNEAPOLIS—A. L. McCarthy of Bendix Home Appliances, Inc. conducted a series of meetings recently for appliance dealers here, discussing sales of Bendix home laundry units.

La Plant's Prospects 'Go For' Free Cigars, Flowers, Food

SHEBOYGAN, Wis.—Free cigars, flowers, movies, and refreshments attracted several good prospects to the open house held on a recent Sunday from noon to 5 p.m. by La Plant's, appliance dealership.

Virginia Dealer Remodels To Improve Display

STAUNTON, Va.—Campfield's, General Electric outlet here, is remodeling its quarters to provide a more effective appliance display.

HOW
KINETIC ADVERTISING
WILL WORK FOR YOU
Again
IN 1941 . . .

1941
•
SEE
BELOW

THIS YEAR, SOMETHING NEW!

JOHN PUBLIC knows a little about air conditioning and refrigeration. But he doesn't really know as much as he should about why they comprise one of America's most important industries.

That's why, since 1937, Kinetic has advertised in a large list of business papers in many fields to further the interest in and use of air conditioning—thus benefiting the entire industry. Samples from TIME magazine are shown above.

This year, we have planned a new approach. It is designed to tell John Public more about air conditioning and refrigeration. About their strange and exciting—yes, exciting—uses in industry. About their benefits to mankind—in health and in profits. How they help American industry "tool up" faster. And how refrigerated "food-banks" are changing the buying habits of a million families!

These are some of the things this year's Kinetic advertising will tell the readers of TIME. And this stimulation of public interest in air conditioning and refrigeration will contribute to better business for you. Better business for us, too, because the advantages of "Freon"* refrigerants are such that they have come to be used almost exclusively for air conditioning, in most of the household refrigerating units now being built, and in a majority of new commercial units.

"Freon" refrigerants meet all the specifications for safety set by the Underwriters' Laboratories of Chicago. Kinetic Chemicals, Inc., Tenth and Market Sts., Wilmington, Delaware.

KINETIC
FREON
REG. U. S. PAT. OFF.
safe refrigerants

*"Freon" is Kinetic's reg. trade mark for its fluorine refrigerants.

AIR CONDITIONING & REFRIGERATION NEWS

Trade Mark registered U. S. Patent Office; Established 1926 and registered as Electric Refrigeration News

F. M. COCKRELL, *Founder*

Published Every Wednesday by
BUSINESS NEWS PUBLISHING CO.
5229 Cass Ave., Detroit, Mich.
Telephone Columbia 4242

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Labor Shortage May Be Serious

DIFFICULTIES besetting manufacturers and suppliers of fabricated equipment in the refrigeration and air conditioning field thus far have been largely confined to scarcity of certain metals.

Happily for the industry, the deplorable strikes which are so seriously hampering the best efforts of so many manufacturers serving the rearmament program have not thus far infected refrigeration concerns. Far-seeing employe relations programs, fair treatment, and good pay, have been paying the industry good dividends.

LABOR MAY PROVE MAJOR HEADACHE

Labor, however, may yet prove to be the major headache of the industry. The unparalleled productive activity which the rearmament program and the aid-to-Britain program will evoke is likely to make a shortage of labor so acute that present difficulties with raw materials shipments will seem mild, indeed.

Hundreds of thousands of additional laborers of varying degrees and types of skills will be needed. As the draft removes more and more men from the labor market and from present employment, the problem will be magnified. So far the needs of both the Army and the rearmament program have been only small samples of the needs that will arise when the magnitude of the war we are entering becomes apparent.

MORE JOBS AND MORE CONSCRIPTEES

Plants now a-building will open their maws to laborers throughout the latter half of 1941. Concurrently, the likelihood is that the Administration will deem it necessary to double the size of the Army, and conscriptees will be inducted much more rapidly than heretofore.

Wise management will begin now to provide means of "hedging" against scarcity in manpower. First off, those who look ahead will make careful manpower surveys of the adjacent neighborhood. It should include an analysis of the type of men on WPA projects, on relief, on employment service rolls, and even those employed at relatively non-productive jobs.

Such analysis should include notations as to each man's likelihood of being drafted, his previous experience, his skills, and his aptitudes.

This will cost money. So will the training program which should be instituted immediately following the survey. But it will be money well invested—money invested in *survival.*

If it becomes necessary to import labor, sources of supply should be tabbed. After that, provisions should be made for their housing, recreation, and care.

These problems, of course, are already being met in many metropolitan centers, and in industries which are now engaged in rearmament work. Many manufacturers, however, have not yet come face-to-face with the problem. Other worries seeming more imperative of attention, they have not yet begun consideration of what may become their biggest worry of all.

By this time next year, *all* employers—whether manufacturers or not—will likely be acutely aware of the impending labor shortage. And now is the time to begin developing your reserves of manpower.

Retail Sales Are Keeping Pace

FIELD INVENTORIES of refrigeration products have been worrying some industry leaders. It has not seemed probable to them that the tremendous quantities of stuff they were shipping jobbers, distributors, and dealers was moving "over the counter" as fast as it was arriving.

"Where is it all going?" they have asked. "Where are they warehousing it? And where are they getting the money to finance such extraordinary purchases?"

Field stock figures are always difficult to obtain. One must "dig test holes" in various representative cities in order to come to any sort of fair conclusion about the state of dealer stocks.

CONSUMERS ARE REALLY BUYING

But from all the information the NEWS can obtain at present— information gathered by our own staff of reporters, and gleaned from distributors' reports—the "stuff" is really flowing into consumers' hands at a phenomenal rate.

Particularly in the Southwest and Middle West, retail sales are actually keeping pace with shipments from the factory. There are occasional instances discovered of jobbers and distributors buying ahead to "hedge" against price rises. But these are said to be isolated.

Most dealers haven't the credit or facilities to stock up more than a few months ahead. All dealers interviewed by the NEWS report unprecedented demand for refrigerators, and an unusually high proportion of cash sales.

Fact of the matter is that the "poor man's prosperity" of the rearmament program is coming faster than most people have expected. Sales for 1941 seem sure to break all existing records.

They'll Do It Every Time . . . . . By Jimmie Hallo

JIGGERS! PESKY! HERE COMES BIG TIGE!
SCRAM OUT OF THERE QUICK, YOU NITWIT! THE BOSS IS BACK!
NO-NO-DON'T TRY TO PULL ANY OF THAT APRIL FOOL STUFF ON ME. I WASN'T BORN YESTERDAY, Y'KNOW. REMEMBER, WHEN IT COMES TO GAGS, I WROTE THE BOOK.... PICTURE OF OLD PICKLEPUSS DICTATING A LETTER- HAROOMPH-AHEM-HAROOMPH! DEAR SIR -
HE'S PULLE SO MANY CO GAGS TODA CAN'T BELIE ANYBODY E COULD BE THE LEVE
IT'S OKAY BY ME, I'M SATISFIED.
APRIL 1
GEN. MANAGER
HAVANA
EVERY DAY IS APRIL FOOL'S DAY WITH ONE OF THESE GUYS AROUND AN OFFICE
THANX TO WM. GOERTZEN, BOISE, IDAHO.

BOOK REVIEW

"Modern Air Conditioning, Heating, and Ventilating." Authors: Willis H. Carrier, Realto E. Cherne, and Walter A. Grant. Published by: Pittman Publishing Corp., New York City, Review by: Henry Knowlton.

DURING recent years air conditioning practice in the field has advanced more rapidly than printed information on the subject has been made available. One reason for this situation is the amount of time and effort necessary to assemble and present a large mass of technical data; another has been a certain reluctance to make public many "tricks of the trade."

Thus with the appearance of this book, Mr. Carrier and his two associates are to be commended on two counts; first, for the prodigious work that has gone into this 547-page textbook; and secondly, for making the broad experience of Carrier Corp. available to the industry.

To say the volume contains all there is to know about air conditioning would be an overstatement, but it does contain a great deal of information never before made public.

While few people can sit down and read a textbook with enjoyment, all salesmen, sales engineers, and application engineers in the heating and air conditioning field should find a study of this volume profitable.

The chapters on Estimating Requirements, Economics, Air Distribution, and Application Practice, might well come under the heading of "required reading" for anyone interested in obtaining a comprehensive knowledge of the air conditioning business.

Because a thorough knowledge of costs is essential to making any distributorship profitable, the chapter on estimating should prove worthwhile from this standpoint. The complex subject of basic costs for material, labor, services, and sub-contracts is well covered in this section of the book.

During recent years more and more air conditioning is being purchased on a "dollars and cents" basis—commonly known as the "profit motive." The section on the "economics" of air conditioning makes it possible to analyze the business of a prospective customer, and find out if it would be good business for him to purchase air conditioning equipment, based on industry experience.

The authors' viewpoint is that most air conditioning should be considered as a long term investment and its cost amortized over a period of years.

Every man having contact with buyers of air conditioning should have a thorough knowledge of the information set forth in this chapter. Formulae and tables for estimating the first cost and operating cost of various types of air conditioning systems, together with amortization tables, make it possible to tell the prospective buyer what air conditioning can do for his business and what it will cost over a period of years.

Stressing the importance of the preliminary approach to any air conditioning problem, the chapter on "Application Practice" should prove particularly interesting to men on the firing line. The chapter gives "features" of systems applied to different types of business, recommended "practice" in making applications, and "precautions" to observe in relation to the various installations.

The section on "Air Distribution" covers all known methods for air handling in both heating and cooling systems.

"Typical air conditioning guarantees," designed to place responsibility where it belongs, are presented in the appendix, which also gives tables used in the design of air conditioning systems.

The book should find considerable use as a text, in the teaching of air conditioning; as a handbook for the application engineer, and as a source of essential information for sales engineers and others engaged in the sale of air conditioning equipment. For the latter, the book will provide a tool which has not been available heretofore.

LETTERS

FORMER HIRSCH EMPLOYE SEEKS HIS ADDRESS

J. H. H. Voss Co.
408 Concord Ave., New York, N. Y.

Dear Mr. Taubeneck:

I would be very much obliged to you if you would let me know the address of Mr. M. Hirsch, formerly consulting engineer in Germany, who is now in an internment camp in England.

I learned that you published a letter which he recently sent to you and therefore I assume you might be able to give me his address.

I formerly worked as a draftsman under Mr. Hirsch and would like to send him a little package containing cigarettes, etc.

I would appreciate it very much if you would be kind enough to give me this information.

J. H. H. Voss

Answer: As you have probably noted by now, in the March 12 issue of AIR CONDITIONING & REFRIGERATION NEWS we published our most recent letter from M. Hirsch in which he says that he has been released from the English internment camp.

His address is now what it was before his internment—106A Lee Road, Blackheath, London, S.E.3.

NEWS IS REALLY REFERENCE LIBRARY

3409 Missouri
St. Louis, Mo.

Editor:

I have left the refrigeration service field, and am now engaged in other lines of work, and therefore wish to discontinue my subscription to the NEWS.

The NEWS is one of the best trade journals I have ever had the pleasure to read and I have thoroughly enjoyed its every issue since I subscribed some five years ago.

The NEWS has been a source of much help and information to me and I have every issue on file as a reference library. It has been a pleasure to be a reader of the NEWS all these years I assure you. Sorry to be leaving such a good company and wishing you success always, I beg to remain

FRED A. HUEBNER

'VERY MUCH PLEASED' WITH MANUAL 2

12 Prospect St.
No. Plymouth, Mass.

Sirs:

I recently purchased from you Manual No. 2 of the household refrigeration series. I am very much pleased with it but find many references to Manual No. 1 of the same series. Therefore, I am enclosing a dollar with which to purchase Manual No. 1 of the Household Refrigeration Series.

HENRY MALONE

Cafe Owner 'Surrounds' Customers With Foods In Cases & Coolers

If the customer wants to inspect the cut of beef from which he will get a nice juicy steak he doesn't have to get out of his chair at Shore's restaurant in Detroit.

• • •

DETROIT — Serving upwards of 5,000 steak, turkey, duck, and chicken dinners during a single day in Shore's Restaurant would never have been possible without the use of refrigerated display equipment. As an example, Robert Shore declares that steak sales have increased 250% since a glass enclosed porcelain clad walk-in refrigerator was installed at the front of the restaurant a few months ago.

Located in an old bank building on Detroit's west side, Shore's restaurant does not have a location which would normally attract an astronomical number of customers. Refrigerated display cases are used, however, to "sell" aged meats, pies, and fowl to the customers.

The new walk-in refrigerator, installed by Stanley Hill of Refrigeration Sales Co. here, is located against the front wall of the building, just inside the front door. Its gleaming white porcelain and glass exterior is in full view of the customers.

Equipped with a Frigidaire "Steri-cold" system, the walk-in refrigerator measuring 15 ft. by 10 ft. is used for aging steaks under three ultra-violet lights. A 1-hp. compressor operating two forced draft wall mounted units is used to keep the temperature at from 42° F. to 44° F.—about 4° higher than the normal walk-in refrigerator.

With this system in operation steaks are "aged" in approximately one week, without the appearance of mould, where the former process required at least 30 days—at a lower temperature.

Insulated with 4 inches of cork, and lined with tongue and groove fir, the refrigerator has a double plate glass section on the front, so that patrons can see the meat hanging inside. Two sheets of ¼-inch plate glass were installed in liquid rubber and the air space dehydrated with silica gel.

Some forty odd sides of beef are kept in the refrigerator, and patrons are encouraged to go inside and inspect the perfect condition of the meat. With no "whiskers" forming on the beef during the aging process, because of the ultra violet light treatment, the musty smell of meat refrigerators is noticeably absent.

After the steaks are aged in the walk-in refrigerator they are transferred to a series of display cases installed down one side of the main dining room. Mr. Shore reports that the sides of beef must be kept colder than 44° F. to be firm enough for cutting when they are needed.

Another display case is used for pies, making it possible to serve all kinds of "soft" pies during periods of hot weather. Still other cases are used for turkeys, chickens, and ducks, all cooked and ready to take out. For example, a cooked, stuffed, completely prepared chicken is sold for $1.10.

Other refrigeration used by the restaurant includes soda fountain equipment, a beer cooling system and bar refrigerators; a walk-in refrigerator in the basement, and a number of reach-in units used for kitchen service.

All of this refrigeration is essential to the volume of business done—as each week Shore's handles over 1,000 lbs. of prime beef, 1,000 chickens, 700 ducks, and over 100 turkeys weighing approximately 30 lbs.

With the number of customers served steadily growing, refrigeration facilities of the restaurant are being constantly expanded. Every Saturday and Sunday customers are turned away—with commercial refrigeration playing a major part in the expansion program.

Chrome Steel Used In Fluorescent Lights

PERU, Ill. — Manufacturers of fluorescent lighting fixtures are replacing aluminum and other metals with American Bonded chrome steel, according to American Nickeloid Co. here.

New mailing piece of the company describes use of its chrome steel and chrome aluminum in fluorescent lighting, both as a structural or decorative part of the fixture and as a diffuser of light. Supplied in either sheet or coil form, these metals can be furnished with adhered paper to protect the finished surface during fabrication.

U. S. Naval Base To Have $4,000 Storage Plant

NEW ORLEANS — Contract at $4,000 for installation of refrigeration equipment in the food storage plant of the U. S. Navy aviation base at Lake Ponchatrain has been awarded Woods, Inc. The plant consists of four rooms, refrigeration being supplied by two Frigidaire 1½-hp. units.

Thompson Opens Branch Office In Chicago

CHICAGO — Emery Thompson Machine & Supply Co. has opened a showroom at 1122 S. Michigan Ave. here for display of the company's full line of ice cream freezers, soda fountains, hardening cabinets, and compressors. This office also will serve as western service headquarters for Thompson freezers.

William J. Morrissey, formerly manager of the firm's New England division, will head the new Chicago office.

300-Locker Plant Ups Butcher's Business

MEXICO, Mo.—Hulen Home Kill Meat Market has completed a 300-locker frozen food storage plant here. Harry Hulen, owner and manager of the plant, uses from 20 to 40 of these lockers himself in connection with his meat wholesaling operations. Erection of the locker plant has considerably expanded the company's butchering business, Mr. Hulen reports.

Car Pre-Cooling Firm Adds a Mechanical Unit In Texas Service

BROWNSVILLE, Tex. — Another truck equipped with a self-contained air conditioning system has been added to the fleet operated by Shippers Precooling Service, Inc. here, which precools railroad cars for shipment of produce from field to market, covering a 10-state area.

"Freon-12" condensing unit on the truck has an ice melting equivalent capacity of 40 tons daily.

Potato growers in Idaho, apple growers in Oregon, and canteloupe growers in Texas have found the precooling service a great help in preserving produce on the long trip to city markets. Food products are packed in freight cars and covered by a canvas which acts as a top to a plenum chamber.

The refrigerating truck runs alongside and "pipes" cooled, conditioned air into the railroad car, bringing both car and product to the proper temperature. Often temperatures in railroad cars which have been standing in the sun for long periods soar well over 100°.

Relative humidity of the air in the car likewise is maintained at a desired level to preserve properly the product and prevent shrinkage. Air passing through the storage space collects at the top of the car and is drawn back to the refrigerating unit for reconditioning.

One truck, in service for four years, has conditioned 1,800 railroad cars, operating on an average of three hours for cooling of each car. Carrier units are installed on the trucks.

President and general manager of the precooling service is Mr. Killingstad, and Frank Persons serves as cooling supervisor.

Manganese Substitute Recommended to OPM

WASHINGTON, D. C. — Use of spiegel, an alloy containing about 20% manganese, as a substitute for ferromanganese and emergency conservation of manganese through consumer-producer cooperation were analyzed in a report by John D. Biggers, director of the production division of OPM.

Emergency conservation could save 20% of the consumption of ferromanganese, according to the Technologic Committee on Manganese of the National Academy of Sciences. This committee of ranking scientists was appointed July 25 to study projects for development of new processes for recovery of manganese from low grade domestic ores.

Certain domestic ores are available for production of spiegel, the scientists reported.

Meat Distributor Adds Frozen Food Cold Room

BINGHAMTON, N. Y.—Construction of a new cold room to hold temperatures at 0° F. or lower has enabled E. B. Gale Co., Inc., distributor of meats and other food products, to take on distribution of Birds Eye frosted foods in this territory.

In the remodeling operations two layers of 4-inch Armstrong corkboard were erected as insulation for the frozen foods storage room, with super-service corkboard on the outside. The beef cooler room was finished with two layers of 2-inch corkboard, with super-service corkboard outside.

Centrally Located Brine Spray Cooler Solves Problem In Mushroom 'Mine'

WEST WINFIELD, Pa. Refrigeration equipment is filling an important function in the growing of mushrooms several hundred feet underground at the Butler County Mushroom Farm here. Complete plant operation growing, packing, and storage is housed in an abandoned limestone mine more than 300 feet from the surface of the ground.

The plant handles about 5 tons of mushrooms per day as they come from the growing beds, with sorting and packing operations being conducted on an "endless belt" conveyor system in which trained girl workers grade the product according to size and pack it in crates, for storage.

In the storage cooler, about 20 x 50 feet in size, the mushrooms are kept at between 32 and 34° F., with about 85% relative humidity, conditions which have been found most conducive to proper preservation of the product. Equipment consists of two Carrier condensing units, one of 3 hp. and the other of 2 hp., interconnected and operating on a pressure sequence, together with a brine spray cooling unit. The system was installed by the Dan H. Willis Co., Carrier distributor.

Most difficult problem in connection with the system's installation was that of introducing air into the storage space with minimum noticeable air movement, since mushrooms are very sensitive to air motion of any type. This was solved by placing the cooling unit at the center of one of the 50-foot walls, to allow air movement in the largest possible section of the space with smallest perceptible motion.

James Installed 150 Beer Dispensers In 1940

ST. LOUIS — More than 150 installations of beer dispensing equipment were made by the commercial refrigeration department of James & Co., General Electric distributor, during 1940—with patrons of each tavern guests of the company at an "on the house" party the evening the new equipment went into service.

Point of the party, in addition to its obvious goodwill benefits, was to point out to tavern patrons the advantages of the new refrigerated dispensing equipment.

Storages Near Farm Cut Costs on Apples

HARRISBURG, Pa. Apple storage plants located near the farm show an operating cost of 8 to 9 cents per bushel, as compared with 22 cents for commercial cold storage, according to William R. Cole of the Massachusetts State College. Speaking here recently Mr. Cole said: "Averages for approximately 75 cold storage plants show a bushel cost for services of 13 to 14 cents per bushel. Some farm storages show costs of as low as 8 or 9 cents."

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Impossible . . . But

Here's How the New Deepfreeze Storage Unit Was Developed

Engineers Were Skeptical When Morrison Proposed a Cylindrical Type Coil

CHICAGO—Story of the technical development of the Deepfreeze home storage unit for frozen foods and a description of the mechanical and refrigerating factors involved in the unit's construction was outlined some time ago by C. L. Olin, western national accounts manager for Servel, Inc.'s electric refrigeration and air conditioning division, in a talk before the Chicago chapter of A.S.R.E.

The Servel organization supplies the condensing unit for the Deepfreeze units.

Mr. Olin starts his story by telling of the man responsible for the Deepfreeze development—W. L. Morrison.

"Mr. Morrison is an automotive engineer," explains Mr. Olin, "an independent inventor. He maintains a shop in North Chicago, and in this shop he has turned out cars for almost every large manufacturer in the automotive field.

INVESTIGATION STARTS

"One of his clients has been Motor Products Corp., Detroit manufacturer of automobile hardware, body trim, panel boards, cowls, etc. About two years ago this company asked Mr. Morrison to investigate the refrigeration and air conditioning field in order to determine whether or not there was any opportunity for Motor Products, as a manufacturer, to profitably produce parts or subassemblies for this industry.

"Motor Products Corp. does a great deal of sheet metal fabrication, so it was perhaps natural that Mr. Morrison should in the course of his search consider the production of a plate type coil of the 100% primary surface type.

"He struck upon a design which was essentially two pans welded together at the rim with channels inserted between to make up the refrigerant circuit. His idea was to so fabricate the channel that it also would serve to stiffen the plates.

"This development looked encouraging, but lack of certain distributing facilities discouraged its further exploitation. As a result of the work done along those lines, however, Mr. Morrison conceived a cylindrical type of evaporator.

"Now, there were a number of us who were ready to discourage Mr. Morrison in even his first work in connection with the plate coil. We could conceive all manner of things that would be wrong or that might give trouble.

"'Was it possible,' we asked, 'that even with the elaborate seam welding apparatus available at Motor Products a joint could be obtained at the rim of such a coil that could be depended upon, and that would not fatigue through the expansion and contraction in service?'

WHAT ABOUT CORROSION?

"'Further,' we wondered, 'was it possible that the hazard of internal scale and subsequent corrosion could be eliminated?'

"But Mr. Morrison was not to be discouraged. He was grateful for the advice that was offered, but he contended that such experience as the industry had had must necessarily be modified in the light of the advancement of the art of metal processing and fabrication. So he went on to develop a 100% primary surface plate coil that was entirely practical in every respect.

"When he proposed a cylindrical type coil, we immediately questioned whether he could expect any more favorable experience than we had had in the early '20's when we attempted to use cylindrical type evaporators in the conversion of iced type soda fountains to mechanically refrigerated soda fountains.

TEMPERATURE PROBLEM

"We had made up such evaporators out of two sleeves welded at the top and bottom rims—and they had been anything but satisfactory. We had encountered wide differences in temperature from top to bottom, and also had been confronted with such incidental problems as oil logging and refrigerant leaks.

"In addition, the evaporators used in those attempts were none too efficient. The refrigerant used was methyl chloride and probably the concentration of oil was a big contributing factor, but certainly the low velocity also was a big factor in the apparent low heat transfer characteristics we obtained.

"Mr. Morrison, however, could not see why this cylindrical type evaporator could not be made to function just as satisfactorily as the plate type he had perfected. And sure enough, he did produce a cylindrical type evaporator that functioned very satisfactorily.

THE WAY OUT

"He felt that the best way to secure the minimum temperature difference between top and bottom of this evaporator was to arrange for an up-and-down refrigerant flow. He achieved this effect through the use of spacers or interstices arranged vertically between the outer and inner sleeve of the evaporator unit.

"Refrigerant ('Freon-12') enters the bottom of one of the vertical channels and leaves from the top of another channel practically opposite the point where it enters.

"This arrangement is combined with the use of a unique oil return tube, a heat interchanger, and a thermostatic expansion valve of the fixed power element charge type.

"The ratio of primary surface (exposed) to space refrigerated is 11.7 sq. ft. to 4.4 cu. ft. Dehydration of products is reduced to nil due to the small differential between space temperature and evaporator surface temperature. Further, this means greater efficiency at the refrigerating machine due to the higher suction temperatures possible to secure a desired space temperature.

"Many designs of cabinets contain a liner which simply makes up the storage space, and in some instances the evaporator coil is affixed to the 'insulation side' of this liner. In the Deepfreeze unit, however, the liner is also the evaporator and is also the basic structural frame of the entire cabinet. Here is a cabinet that is literally wrapped around the evaporator.

DESIGN SPECIAL UNIT

"We were called in to supply a condensing unit for this device, and ended up by designing a special unit for the purpose. This unit is made up somewhat along the lines of the conventional so-called vertical design, except that we have combined the condenser shroud and basic frame in one piece, making this unit unique in that the compressor and motor are actually mounted or supported by the condenser shroud.

"The center of gravity mountings of the motor and compressor on a common plate supported by resilient supports isolates the vibration to the compressor motor assembly. As a result the condenser, receiver, and condenser shroud remain rigid, and the condenser shroud can be secured directly to the base of the Deepfreeze cabinet.

FACILITIES ENLARGED

"Deepfreeze shipments are now going forward from North Chicago at the rate of 15 to 20 units a day. The original facilities of the plant have been enlarged and improved upon to a point where a daily production of from 75 to 100 units will be possible.

"These improvements include drawing the top rim with a die rather than spinning it as previously done, drawing the evaporator shells rather than wrapping them around with a welded seam, converting much of the fabrication of the machine compartment to punch press work, installing line production methods of assembly, installing a rather elaborate test rack and testing instruments by which means an operating record is secured on every unit shipped, and installation of two ovens to secure a better and more consistently uniform paint job on the exterior and the evaporator.

"This, then," Mr. Olin concludes, 'is the story of the origin and development of the Deepfreeze unit."

Refrigeration Is Ahead Of Defense This Time

BUFFALO—Rigid national defense regulations of the Office of Production Management were relaxed recently as a special dispensation to make it possible for Hygrade Food Products Corp. to obtain a badly needed replacement part for its refrigeration equipment, and thus to continue normal operations and prevent spoilage of 150,000 pounds of meat.

A broken refrigerator pump at the Hygrade plant here threatened to result in a shutdown of all operations and spoilage of the meat. An impellor was needed from a Detroit refrigeration equipment manufacturer to repair the damage.

It so happened, however, that the Detroit firm was busy on defense work and OPM priority rulings prevented the Hygrade plant from obtaining the necessary part on such short order. So George Caspar, plant superintendent, appealed to Senator James M. Mead of Buffalo to intervene in the case.

Result: Senator Mead explained the situation to the OPM priorities division; OPM officials, anxious to avoid any tieup or waste in the country's important meat packing industry, relaxed their rules and instructed the Detroit manufacturer to ship the needed part immediately; and the new impellor was installed in the Hygrade plant within 48 hours after the accident had occurred.

Answer To a Serviceman's Prayer —That's Canadian Quiz Session

TORONTO, Ont., Can.—A variety of worthwhile suggestions regarding the cause and cure of some common refrigeration ailments and hints on applications of equipment evolved from the "Information Please" sessions conducted after each session of the recent Canadian Refrigeration Exhibition sponsored here by the Ontario Maple Leaf chapter of R.S.E.S.

Conductor of the sessions was H. S. Parish of Kelvinator of Canada, who kept the questions and answers moving smoothly between the service engineers and the various "experts" comprising the quiz board. Convention speakers were drafted for the board on the day on which they appeared on the convention program.

"Experts" included R. J. Thompson of Kinetic Chemicals; J. J. Goodwin of Temprite; Paul Penn of Penn Electric Switch; P. Domke of Mueller Brass; A. F. Sawyer of Dole Refrigerating Co.; R. E. Townsend of Detroit Lubricator; K. M. Newcum of Superior Valve & Fittings; G. E. Graff of Ranco; and C. R. Jones of Keyes Supply Co. Ltd., Ottawa, Ont., who served as a "guest expert" on the first day's session.

Some typical questions and answers follow:

CAUSE OF FREEZER BURN

Question—What causes freezer burn and what effect has it on meats?

Answer—Freezer burns are caused through excessive dehydration and the effect on the meat is to turn it into a dry brown fiber. To avoid freezer burns, meat should be thoroughly wrapped in the proper moisture-proof paper.

CONTROL LOCATION

Question—What is the best position to locate temperature control in a meat box?

Answer—Usually on the back wall of the refrigerator in a position where average temperature is maintained and where it is not affected by either door opening or cold air flue.

AMMONIA TROUBLES

Question—What may go wrong with an ammonia compressor to cause inefficient operation?

Answer—Failure to install a scale trap may result in scale and dirt interfering with the proper action of the compressor valves.

LOST VACUUM

Question—What happens if vacuum plates lose their vacuum and how will you know this?

Answer—(1) Heat transfer is considerably reduced. (2) Tapping the plates with the hand will produce a rattle if vacuum is lost.

COLD PLATE INSTALLATION

Question—How would you recommend installation of a cold plate in a reach-in box?

Answer—Take advantage of the vertical surface; it should be hung in a vertical position at the back of the box about 4 inches down and about 2 inches from the back wall (approximately). Where gas engine drive is used, about an 18° Eutectic should be used.

SILICA GEL AND SULPHUR

Question—We have used Silica Gel driers with satisfactory results on "Freon" and methyl installations, but find they plug up when used with sulphur.

Answer—A small amount of moisture in a "Freon" or methyl job does not cause the same amount of dirt and sludge to form as it would in a sulphur installation. In using the Silica Gel drier on a sulphur job it is advisable to use a filter cartridge ahead of the drier.

OIL SEPARATOR EFFICIENCY

Question—Where an efficient oil separator is used is there any danger of insufficient oil reaching the moving parts of floats or expansion valves?

Answer—With the most efficient oil separator there is still a small amount of oil that will pass over with the vapor which is quite sufficient to insure the working parts will receive lubrication, although very little oil is required at these points.

TEMPRITE FREEZEUP

Question—What causes a Temprite to freeze up?

Answer—A leak in temperature control valve, or a shortage of refrigerant which at a critical stage would cause the float valve needle to barely close.

FANS WITH COLD PLATES

Question—With cold plates, can fans be used to increase the capacity of the plates?

Answer—While little has been done along the line of using fans with cold plates, there is no doubt they would increase the efficiency, but due to the shape and design of the plates it does not appear to be very practical.

REMOVING METHYL ALCOHOL

Question—How would you recommend methyl alcohol be removed from a system when it had been put in to clear up a moisture condition in an emergency?

Answer—(1) The surest way would be to completely discharge the system. (2) A large drier would probably pick up this alcohol providing the amount put in the system was not too great.

TOO MUCH OIL

Question—What is the indication of too much oil in a Temprite?

Answer—Heat transfer is reduced and liquids being cooled would be at a much higher temperature than desired.

OIL SEPARATOR LEAK

Question—What effect has a leaking oil separator on a unit?

Answer—This is a definite leak from high to low side and would cut down the efficiency of the unit just as a leak in compressor discharge valve will affect the operation.

500-Hp. System To Cool Business Machine Plant

ENDICOTT, N. Y.—International Business Machines Corp. will install a 500-hp. York turbo-compressor water cooling system for air conditioning its new building here.

This building will house the machine shop; also the tool room and special production departments.

Observing increased efficiency of workers in a previously air conditioned section of its plant I.B.M. purchased air conditioning for this entire building solely to provide for the comfort of the factory workers.

To aid in decreasing the heat load the building will be illuminated throughout by fluorescent lighting.

The factory to be air conditioned is 450 feet long by 140 feet wide, with three floors. A low-pressure steam turbine drives the turbo compressor, using exhaust steam which would otherwise have been wasted, thus the air conditioning power cost is negligible, it is claimed.

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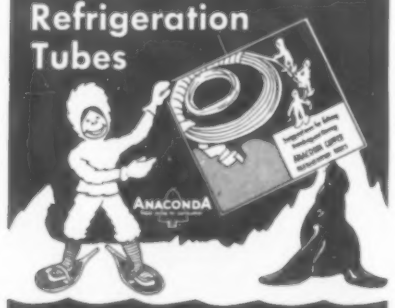

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TRENTON, N. J.

New Products Get Big Play At Canadian Refrigeration Show

New equipment exhibits were crowded between business sessions of the recent Canadian Refrigeration Show in Toronto, sponsored by the Maple Leaf chapter of R.S.E.S. Here (at left) in the Resco booth, are Ken Wall, Refrigeration Maintenance Co., Cleveland; Gordon Burns, Toronto; Warren Farr, also of Refrigeration Maintenance; and H. T. McDermott, national R.S.E.S. secretary. Second from left: Service wives were just as interested in the new products as were their husbands, as indicated by this scene in the Delco booth, showing Mrs. James Spence, Mrs. W. Sneath, and Mr. Spence. Second from right: Caught by the camera in Railway & Engineering Specialties booth were M. Baclean, J. Lyall, and an unidentified visitor at the exhibit. Right: Facts and figures were interesting to convention-goers. Here H. Pick, T. Blay, and two companions "talk turkey" with Mac McCracken.

'Tag-Ends' From Toronto

News Notes on the Canadian Exhibition

By T. T. Quinn

This year's Canadian convention and exhibition passed the 1940 Toronto show both in number of service men attending the educational sessions and attendance at the banquet, despite weather that was unfavorable, to say the least. More than 200 men registered for daily sessions, and banquet attendance exceeded 300.

* * *

About the only way the average visitor to Canada has of telling that the country is at war is the number of men in military uniforms he sees in hotel lobbies and on the streets. Canadian refrigeration men report the same material shortages that we experience in this country, but otherwise have felt no restrictions on their operating methods.

* * *

A humor highlight of the meeting occurred when the Penn operating display board, for which a special generator had to be brought in because of Toronto's 25 cycle current, flickered out during one of Paul Penn's demonstrations. Turning to his audience, Mr. Penn shrugged, as if to say, "What do you do now?" From the back of the room came the answer: "Get a service man!"

* * *

Stumping the 'Experts'

"Information Please" discussions at the close of each day's sessions attracted wide interest and a variety of questions—not all of them serious, however.

For example, one question was: "How do you control your wife's temper when a feminine voice comes over the telephone, asking for 'Big Boy'?" None of the "experts" seemed to have the answer to that one.

* * *

Only discernible way in which the "war spirit" evidenced itself during the convention was in connection with attendance awards and booth prizes given by various exhibitors. This year, miscellaneous prizes were supplanted by war savings certificates.

C. R. Davis of Davis Automatic Controls Co., Toronto, won the award offered by Wagner Motor Co. Winners of awards offered by Minneapolis-Honeywell were: Bruce V. Marshall, Toronto; O. A. McKellar, Toronto; Stan Bagwell, Toronto; S. McClintock, Toronto; Bill Marshall, Toronto; George M. Loos, Simcoe, Ont.; Arden Smith, Kingston, Ont.; and E. E. Milburn, Dayton, Ohio.

* * *

Adding an "All-Industry Show" touch to the Canadian convention was the presence of a number of U. S. industry men you'd expect to see at such a gathering. In addition to the eight convention speakers, all of whom were from companies "south of the border," attendants at the two-day show included:

Joe Krall, Detroit Lubricator; Jim Hood, Ansul; Frank Smith, Tecumseh; John Allman, Imperial Brass; Mel Knight, Peerless; Jerry Jernberg, Mills Novelty; George Allen, Mueller Brass; Bill Allen, Par; H. T. McDermott, national secretary of R.S.E.S.; Warren Farr and Ken Wall of Refrigeration Maintenance, Cleveland; John Bush and George O'Harra of Buffalo—to mention only the ones most in evidence.

* * *

Fun Being Fooled

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Every policy adopted by the industry which has made it easier for every member to do business profitably is such a landmark.

The Virginia Smelting Company is proud to be among the leaders who have set up landmarks of progress in the refrigeration field. We shall continue to work steadily for every policy that promises benefit to each and every one of us.

BUY YOUR KINETIC'S FREON-12* VIA VIRGINIA

EXTRA DRY ESOTOO · Methylene Chloride · V-METH-L

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SQUARE D IN REFRIGERATION

New HIGH PRESSURE CUT OUT··· CLASS 9144

Dependable protection against over-pressure where low side control is manual and a simple, single unit, high pressure cutout is required—types for FREON, METHYL AND AMMONIA.

DO IT ALL WITH SQUARE D SWITCH · PROTECT · REGULATE

Jobber Inquiries Invited

SQUARE D COMPANY

REGULATOR DIVISION

DETROIT · · MICHIGAN

Write for Bulletin

Impossible . . . But

Here's How the New Deepfreeze Storage Unit Was Developed

Engineers Were Skeptical When Morrison Proposed a Cylindrical Type Coil

CHICAGO—Story of the technical development of the Deepfreeze home storage unit for frozen foods and a description of the mechanical and refrigerating factors involved in the unit's construction was outlined some time ago by C. L. Olin, western national accounts manager for Servel, Inc.'s electric refrigeration and air conditioning division, in a talk before the Chicago chapter of A.S.R.E.

The Servel organization supplies the condensing unit for the Deepfreeze units.

Mr. Olin starts his story by telling of the man responsible for the Deepfreeze development—W. L. Morrison.

"Mr. Morrison is an automotive engineer," explains Mr. Olin, "an independent inventor. He maintains a shop in North Chicago, and in this shop he has turned out cars for almost every large manufacturer in the automotive field.

INVESTIGATION STARTS

"One of his clients has been Motor Products Corp., Detroit manufacturer of automobile hardware, body trim, panel boards, cowls, etc. About two years ago this company asked Mr. Morrison to investigate the refrigeration and air conditioning field in order to determine whether or not there was any opportunity for Motor Products, as a manufacturer, to profitably produce parts or subassemblies for this industry.

"Motor Products Corp. does a great deal of sheet metal fabrication, so it was perhaps natural that Mr. Morrison should in the course of his search consider the production of a plate type coil of the 100% primary surface type.

"He struck upon a design which was essentially two pans welded together at the rim with channels inserted between to make up the refrigerant circuit. His idea was to so fabricate the channel that it also would serve to stiffen the plates.

"This development looked encouraging, but lack of certain distributing facilities discouraged its further exploitation. As a result of the work done along those lines, however, Mr. Morrison conceived a cylindrical type of evaporator.

"Now, there were a number of us who were ready to discourage Mr. Morrison in even his first work in connection with the plate coil. We could conceive all manner of things that would be wrong or that might give trouble.

" 'Was it possible,' we asked, 'that even with the elaborate seam welding apparatus available at Motor Products a joint could be obtained at the rim of such a coil that could be depended upon, and that would not fatigue through the expansion and contraction in service?'

WHAT ABOUT CORROSION?

" 'Further,' we wondered, 'was it possible that the hazard of internal scale and subsequent corrosion could be eliminated?'

"But Mr. Morrison was not to be discouraged. He was grateful for the advice that was offered, but he contended that such experience as the industry had had must necessarily be modified in the light of the advancement of the art of metal processing and fabrication. So he went on to develop a 100% primary surface plate coil that was entirely practical in every respect.

"When he proposed a cylindrical type coil, we immediately questioned whether he could expect any more favorable experience than we had had in the early '20's when we attempted to use cylindrical type evaporators in the conversion of iced type soda fountains to mechanically refrigerated soda fountains.

TEMPERATURE PROBLEM

"We had made up such evaporators out of two sleeves welded at the top and bottom rims—and they had been anything but satisfactory. We had encountered wide differences in temperature from top to bottom, and also had been confronted with such incidental problems as oil logging and refrigerant leaks.

"In addition, the evaporators used in those attempts were none too efficient. The refrigerant used was methyl chloride and probably the concentration of oil was a big contributing factor, but certainly the low velocity also was a big factor in the apparent low heat transfer characteristics we obtained.

"Mr. Morrison, however, could not see why this cylindrical type evaporator could not be made to function just as satisfactorily as the plate type he had perfected. And sure enough, he did produce a cylindrical type evaporator that functioned very satisfactorily.

THE WAY OUT

"He felt that the best way to secure the minimum temperature difference between top and bottom of this evaporator was to arrange for an up-and-down refrigerant flow. He achieved this effect through the use of spacers or interstices arranged vertically between the outer and inner sleeve of the evaporator unit.

"Refrigerant ('Freon-12') enters the bottom of one of the vertical channels and leaves from the top of another channel practically opposite the point where it enters.

"This arrangement is combined with the use of a unique oil return tube, a heat interchanger, and a thermostatic expansion valve of the fixed power element charge type.

"The ratio of primary surface (exposed) to space refrigerated is 11.7 sq. ft. to 4.4 cu. ft. Dehydration of products is reduced to nil due to the small differential between space temperature and evaporator surface temperature. Further, this means greater efficiency at the refrigerating machine due to the higher suction temperatures possible to secure a desired space temperature.

"Many designs of cabinets contain a liner which simply makes up the storage space, and in some instances the evaporator coil is affixed to the 'insulation side' of this liner. In the Deepfreeze unit, however, the liner is also the evaporator and is also the basic structural frame of the entire cabinet. Here is a cabinet that is literally wrapped around the evaporator.

DESIGN SPECIAL UNIT

"We were called in to supply a condensing unit for this device, and ended up by designing a special unit for the purpose. This unit is made up somewhat along the lines of the conventional so-called vertical design, except that we have combined the condenser shroud and basic frame in one piece, making this unit unique in that the compressor and motor are actually mounted or supported by the condenser shroud.

"The center of gravity mountings of the motor and compressor on a common plate supported by resilient supports isolates the vibration to the compressor motor assembly. As a result the condenser, receiver, and condenser shroud remain rigid, and the condenser shroud can be secured directly to the base of the Deepfreeze cabinet.

FACILITIES ENLARGED

"Deepfreeze shipments are now going forward from North Chicago at the rate of 15 to 20 units a day. The original facilities of the plant have been enlarged and improved upon to a point where a daily production of from 75 to 100 units will be possible.

"These improvements include drawing the top rim with a die rather than spinning it as previously done, drawing the evaporator shells rather than wrapping them around with a welded seam, converting much of the fabrication of the machine compartment to punch press work, installing line production methods of assembly, installing a rather elaborate test rack and testing instruments by which means an operating record is secured on every unit shipped, and installation of two ovens to secure a better and more consistently uniform paint job on the exterior and the evaporator.

"This, then," Mr. Olin concludes, 'is the story of the origin and development of the Deepfreeze unit."

Refrigeration Is Ahead Of Defense This Time

BUFFALO—Rigid national defense regulations of the Office of Production Management were relaxed recently as a special dispensation to make it possible for Hygrade Food Products Corp. to obtain a badly needed replacement part for its refrigeration equipment, and thus to continue normal operations and prevent spoilage of 150,000 pounds of meat.

A broken refrigerator pump at the Hygrade plant here threatened to result in a shutdown of all operations and spoilage of the meat. An impellor was needed from a Detroit refrigeration equipment manufacturer to repair the damage.

It so happened, however, that the Detroit firm was busy on defense work and OPM priority rulings prevented the Hygrade plant from obtaining the necessary part on such short order. So George Caspar, plant superintendent, appealed to Senator James M. Mead of Buffalo to intervene in the case.

Result: Senator Mead explained the situation to the OPM priorities division; OPM officials, anxious to avoid any tieup or waste in the country's important meat packing industry, relaxed their rules and instructed the Detroit manufacturer to ship the needed part immediately; and the new impellor was installed in the Hygrade plant within 48 hours after the accident had occurred.

Answer To a Serviceman's Prayer —That's Canadian Quiz Session

TORONTO, Ont., Can.—A variety of worthwhile suggestions regarding the cause and cure of some common refrigeration ailments and hints on applications of equipment evolved from the "Information Please" sessions conducted after each session of the recent Canadian Refrigeration Exhibition sponsored here by the Ontario Maple Leaf chapter of R.S.E.S.

Conductor of the sessions was H. S. Parish of Kelvinator of Canada, who kept the questions and answers moving smoothly between the service engineers and the various "experts" comprising the quiz board. Convention speakers were drafted for the board on the day on which they appeared on the convention program.

"Experts" included R. J. Thompson of Kinetic Chemicals; J. J. Goodwin of Temprite; Paul Penn of Penn Electric Switch; P. Domke of Mueller Brass; A. F. Sawyer of Dole Refrigerating Co.; R. E. Townsend of Detroit Lubricator; K. M. Newcum of Superior Valve & Fittings; G. E. Graff of Ranco; and C. R. Jones of Keyes Supply Co. Ltd., Ottawa, Ont., who served as a "guest expert" on the first day's session.

Some typical questions and answers follow:

CAUSE OF FREEZER BURN

Question—What causes freezer burn and what effect has it on meats?

Answer— Freezer burns are caused through excessive dehydration and the effect on the meat is to turn it into a dry brown fiber. To avoid freezer burns, meat should be thoroughly wrapped in the proper moisture-proof paper.

CONTROL LOCATION

Question—What is the best position to locate temperature control in a meat box?

Answer—Usually on the back wall of the refrigerator in a position where average temperature is maintained and where it is not affected by either door opening or cold air flue.

AMMONIA TROUBLES

Question—What may go wrong with an ammonia compressor to cause inefficient operation?

Answer—Failure to install a scale trap may result in scale and dirt interfering with the proper action of the compressor valves.

LOST VACUUM

Question—What happens if vacuum plates lose their vacuum and how will you know this?

Answer—(1) Heat transfer is considerably reduced. (2) Tapping the plates with the hand will produce a rattle if vacuum is lost.

COLD PLATE INSTALLATION

Question—How would you recommend installation of a cold plate in a reach-in box?

Answer—Take advantage of the vertical surface; it should be hung in a vertical position at the back of the box about 4 inches down and about 2 inches from the back wall (approximately). Where gas engine drive is used, about an 18° Eutectic should be used.

SILICA GEL AND SULPHUR

Question—We have used Silica Gel driers with satisfactory results on "Freon" and methyl installations, but find they plug up when used with sulphur.

Answer—A small amount of moisture in a "Freon" or methyl job does not cause the same amount of dirt and sludge to form as it would in a sulphur installation. In using the Silica Gel drier on a sulphur job it is advisable to use a filter cartridge ahead of the drier.

OIL SEPARATOR EFFICIENCY

Question—Where an efficient oil separator is used is there any danger of insufficient oil reaching the moving parts of floats or expansion valves?

Answer—With the most efficient oil separator there is still a small amount of oil that will pass over with the vapor which is quite sufficient to insure the working parts will receive lubrication, although very little oil is required at these points.

TEMPRITE FREEZEUP

Question—What causes a Temprite to freeze up?

Answer—A leak in temperature control valve, or a shortage of refrigerant which at a critical stage would cause the float valve needle to barely close.

FANS WITH COLD PLATES

Question—With cold plates, can fans be used to increase the capacity of the plates?

Answer—While little has been done along the line of using fans with cold plates, there is no doubt they would increase the efficiency, but due to the shape and design of the plates it does not appear to be very practical.

REMOVING METHYL ALCOHOL

Question—How would you recommend methyl alcohol be removed from a system when it had been put in to clear up a moisture condition in an emergency?

Answer—(1) The surest way would be to completely discharge the system. (2) A large drier would probably pick up this alcohol providing the amount put in the system was not too great.

TOO MUCH OIL

Question—What is the indication of too much oil in a Temprite?

Answer—Heat transfer is reduced and liquids being cooled would be at a much higher temperature than desired.

OIL SEPARATOR LEAK

Question—What effect has a leaking oil separator on a unit?

Answer—This is a definite leak from high to low side and would cut down the efficiency of the unit just as a leak in compressor discharge valve will affect the operation.

500-Hp. System To Cool Business Machine Plant

ENDICOTT, N. Y.—International Business Machines Corp. will install a 500-hp. York turbo-compressor water cooling system for air conditioning its new building here.

This building will house the machine shop; also the tool room and special production departments.

Observing increased efficiency of workers in a previously air conditioned section of its plant I.B.M. purchased air conditioning for this entire building solely to provide for the comfort of the factory workers.

To aid in decreasing the heat load the building will be illuminated throughout by fluorescent lighting.

The factory to be air conditioned is 450 feet long by 140 feet wide, with three floors. A low-pressure steam turbine drives the turbo compressor, using exhaust steam which would otherwise have been wasted; thus the air conditioning power cost is negligible, it is claimed.

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We Furnish
TRAINED MEN
Don't take a chance! Get the Right Man the First Time. U.E.I. trained men are available in your locality. They make better employees for all positions requiring mechanical ability or technical knowledge . . . because they know their work. We have the man you want. Phone, write or wire us. The service is prompt, confidential and FREE.
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V-BELTS
Silent, vibrationless, dependable, long-lasting. Powerful grip prevents slippage. A nearby distributor carries a complete stock for appliances and machines.
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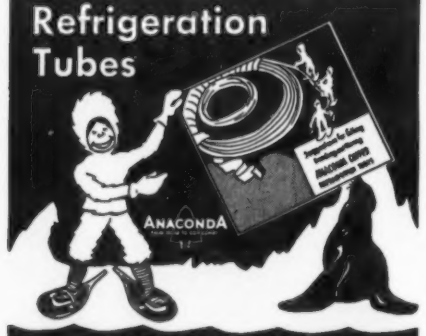

THE AMERICAN BRASS CO.
FRENCH SMALL TUBE BRANCH
General Offices Waterbury, Conn.

Condensing Units for every commercial refrigeration and air conditioning requirement . . . Also packaged air conditioners.
CURTIS REFRIGERATION AIR CONDITIONING and COMMERCIAL
Established 1854
Curtis Refrigerating Machine Co.
Division of Curtis Manufacturing Co.
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MUELLER BRASS CO.
Port Huron, Mich.
TRIPLE SEAL DIAPHRAGM VALVE
Longer Diaphragm Life
Positive Sealing at Three Essential Points

For Information on Motors
FOR ALL TYPES OF
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WRITE TO
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We Sell Only Thru
Distributors of refrigeration and insulation. Get particulars on our
SAF-T-LOC Individual Lockers
and the New "2 in 1" convertible.
Master Refrigerated Locker Systems, Inc.
121 Main St. Sioux City, Iowa
200,000 Masterbuilt Lockers in Use

WATER COOLING EVAPORATORS
COMPLETELY INSULATED
KRAMER-TRENTON CO.
TRENTON, N. J.

New Products Get Big Play At Canadian Refrigeration Show

New equipment exhibits were crowded between business sessions of the recent Canadian Refrigeration Show in Toronto, sponsored by the Maple Leaf chapter of R.S.E.S. Here (at left) in the Resco booth, are Ken Wall, Refrigeration Maintenance Co., Cleveland; Gordon Burns, Toronto; Warren Farr, also of Refrigeration Maintenance; and H. T. McDermott, national R.S.E.S. secretary. Second from left: Service wives were just as interested in the new products as were their husbands, as indicated by this scene in the Delco booth, showing Mrs. James Spence, Mrs. W. Sneath, and Mr. Spence. Second from right: Caught by the camera in Railway & Engineering Specialties booth were M. Baclean, J. Lyall, and an unidentified visitor at the exhibit. Right: Facts and figures were interesting to convention-goers. Here H. Pick, T. Blay, and two companions "talk turkey" with Mac McCracken.

'Tag-Ends' From Toronto

News Notes on the Canadian Exhibition

By T. T. Quinn

This year's Canadian convention and exhibition passed the 1940 Toronto show both in number of service men attending the educational sessions and attendance at the banquet, despite weather that was unfavorable, to say the least. More than 200 men registered for daily sessions, and banquet attendance exceeded 300.

* * *

About the only way the average visitor to Canada has of telling that the country is at war is the number of men in military uniforms he sees in hotel lobbies and on the streets. Canadian refrigeration men report the same material shortages that we experience in this country, but otherwise have felt no restrictions on their operating methods.

* * *

A humor highlight of the meeting occurred when the Penn operating display board, for which a special generator had to be brought in because of Toronto's 25 cycle current, flickered out during one of Paul Penn's demonstrations. Turning to his audience, Mr. Penn shrugged, as if to say, "What do you do now?" From the back of the room came the answer: "Get a service man!"

* * *

Stumping the 'Experts'

"Information Please" discussions at the close of each day's sessions attracted wide interest and a variety of questions—not all of them serious, however.

For example, one question was: "How do you control your wife's temper when a feminine voice comes over the telephone, asking for 'Big Boy'?" None of the "experts" seemed to have the answer to that one.

* * *

Only discernible way in which the "war spirit" evidenced itself during the convention was in connection with attendance awards and booth prizes given by various exhibitors. This year, miscellaneous prizes were supplanted by war savings certificates.

C. R. Davis of Davis Automatic Controls Co., Toronto, won the award offered by Wagner Motor Co. Winners of awards offered by Minneapolis-Honeywell were: Bruce V. Marshall, Toronto; O. A. McKellar, Toronto; Stan Bagwell, Toronto; S. McClintock, Toronto; Bill Marshall, Toronto; George M. Loos, Simcoe, Ont.; Arden Smith, Kingston, Ont.; and E. E. Milburn, Dayton, Ohio.

* * *

Adding an "All-Industry Show" touch to the Canadian convention was the presence of a number of U. S. industry men you'd expect to see at such a gathering. In addition to the eight convention speakers, all of whom were from companies "south of the border," attendants at the two-day show included:

Joe Krall, Detroit Lubricator; Jim Hood, Ansul; Frank Smith, Tecumseh; John Allman, Imperial Brass; Mel Knight, Peerless; Jerry Jernberg, Mills Novelty; George Allen, Mueller Brass; Bill Allen, Par; H. T. McDermott, national secretary of R.S.E.S.; Warren Farr and Ken Wall of Refrigeration Maintenance, Cleveland; John Bush and George O'Harra of Buffalo —to mention only the ones most in evidence.

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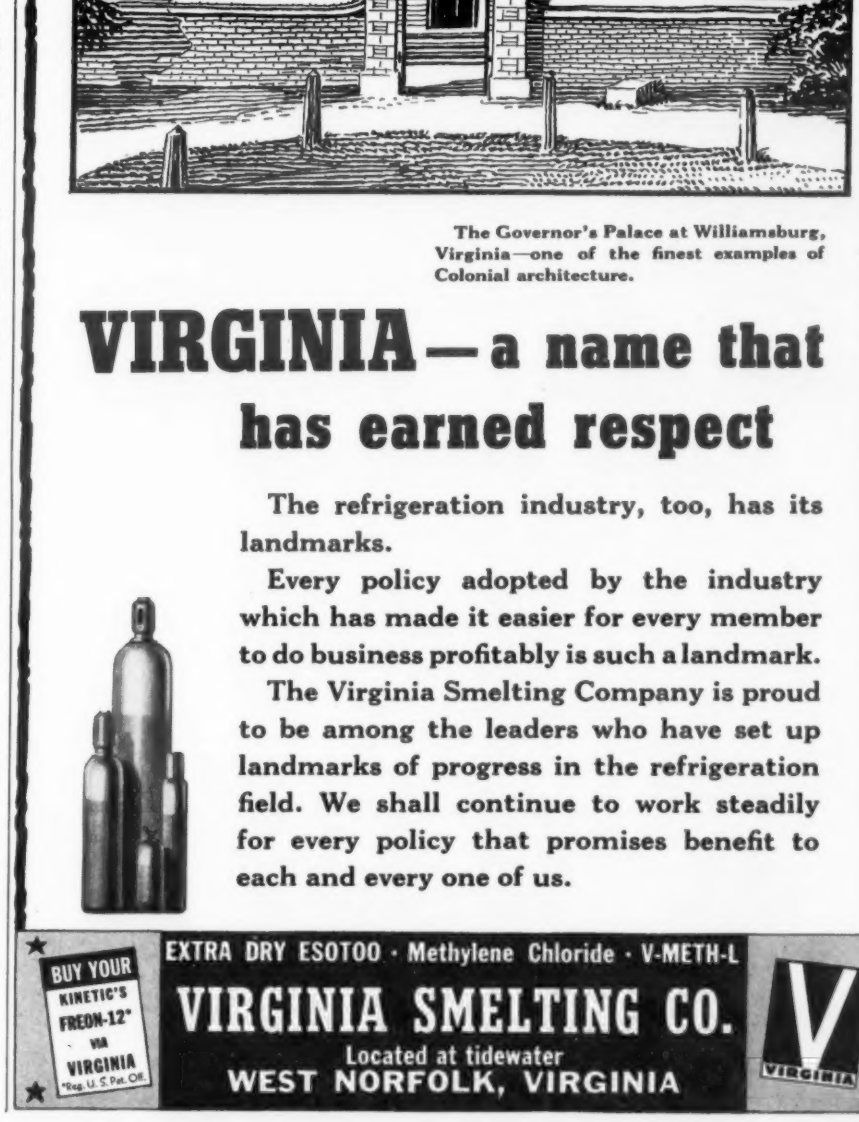

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The Virginia Smelting Company is proud to be among the leaders who have set up landmarks of progress in the refrigeration field. We shall continue to work steadily for every policy that promises benefit to each and every one of us.

BUY YOUR KINETIC'S FREON-12* via VIRGINIA *Reg. U. S. Pat. Off.

EXTRA DRY ESOTOO · Methylene Chloride · V-METH-L

VIRGINIA SMELTING CO.

Located at tidewater WEST NORFOLK, VIRGINIA

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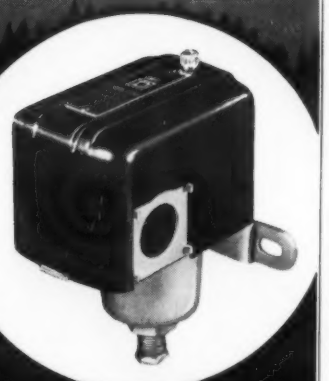
SQUARE D IN REFRIGERATION

New HIGH PRESSURE CUT OUT··· CLASS 9144

Dependable protection against over-pressure where low side control is manual and a simple, single unit, high pressure cutout is required—types for FREON, METHYL *AND AMMONIA.*

DO IT ALL WITH SQUARE D SWITCH • PROTECT • REGULATE



Jobber Inquiries Invited

SQUARE D COMPANY
REGULATOR DIVISION
DETROIT · · MICHIGAN

Write for Bulletin

Westinghouse Engineer Describes the Great Care Needed In Producing Hermetic Refrigerating Units

By W. B. Anderson, Section Engineer,
Westinghouse Electric & Mfg. Co., East Springfield, Mass.

Also Explains Policies on Dehydrating Methods

The hermetic type refrigerating unit as we have it today is a carefully designed and accurately built mechanical and electrical device with a super imposed complicated chemical plant. The system contains oil, refrigerant, traces of water, noncondensable gas, various forms of cellulose, and many different kinds of metal. All of these materials are subject to varying operating conditions of temperature so we have ideal conditions for chemical reactions.

The requirements for a refrigerator operation are quite unusual.

Most of us are very familiar with the unusual progress made in the development and manufacture of automobiles. It is quite startling to compare the operating requirements of an automobile and a refrigerator. An automobile's average life in operating hours is about 1/15 that of a refrigerator.

In other words, we are asking our refrigerators to last the life of 15 automobiles. It is also interesting to note that the average refrigerator makes about 300 million revolutions per year and such parts as valves must flex 600 million times per year.

All of this means that refrigerating units must be built accurately, of the proper materials and under processing conditions which will assure long life and trouble free operation. Most of the refrigerator manufacturers today are so set up that they expect to be in business for years to come and must face the ultimate results of operation of their product in the field.

The compressor housing really is the foundation upon which our compressor assembly is built. It is necessary that this foundation be accurate in all respects inasmuch as the compressor assembly itself consists of a number of parts, all of which are assembled to this housing without adjustments and depend upon the accuracy of the housing to give a resultant accurate assembly.

For example, the inside bore of the housing serves as a locating means and press fit for heat transfer of the stator. The stator, of course, must be accurately located with respect to the rotor and shaft to give uniform air gap.

Front face of the housing serves as a mounting surface for the cylinder and must be perpendicular to the shaft bore. The slot location in the housing face serves as a locating means for the cylinder. The housing material is a good grade of gray cast iron carefully processed in the foundry to give a homogeneous casting free from blow holes. This same grade of cast iron is used for the housing, cylinder, cylinder head, and rotor hub.

Crankshaft is a Nitralloy forging. The forging is machined and rough ground before heat treating. The heat treating process takes place, as you may know, in an ammonia atmosphere. After heat treating the shaft is ground to finish dimensions.

PRAISES NITRIDED SHAFT

Another desirable characteristic of the nitrided shaft is that no trouble is experienced due to warpage or bending from heat treating. The shaft operates in a honed cast iron single overhung bearing. The crank pin operates in the honed bearing of the chrome vanadium steel forged connecting rod. This combination has been used for over ten years and our oldest machines indicate almost unmeasurable wear.

The cylinder is made from a good grade of gray cast iron and must of necessity be free from blow holes and porosity. This section of the cylinder after machining must be tight at pressures as high as 400 lbs. per sq. in.

The cylinder piston fit is held to .0005 to .0007 inch on a diameter. These fits are maintained in production by selective assembly. The cylinder and pistons are respectively measured on electrolimit gauges and segregated in 16 different sizes. Each size varies from the adjacent size by .0001.

The piston is "hogged out" on a screw machine from bars of No. 3 tool steel. Grooves in the wall serve the function of piston rings. Connecting rod is made from a chrome vanadium steel forging.

On the lower end of the connecting rod is a carefully designed oil scoop that throws oil into a catcher that distributes oil to the main bearings and splashes enough to lubricate the crank pin and wrist pin bearings.

One of the most critical parts of our compressor assembly is the valve assembly. These valves, some times called "flapper valves," are made from special high grade Swedish steel. The processing and finishing of this steel results in tensile strengths of around 300,000 lbs. per square inch. The contour of valve tongues is very important.

The valve plate which contains the valve ports and seats is a hardened plate made from cold rolled steel.

'CUSHIONED' VALVE

One of the latest developments in the valve assembly is a so-called cushioned discharge valve. The valve disc itself is slightly dimpled. The seat is composed of two annular seats which contact the valve itself successively as the valve seats. This gives us a cushioning which is beneficial from a noise standpoint.

The cylinder, valves, valve plate, and cylinder head are bolted together.

After the compressor has been assembled it is given a test for performance, gas tightness, and motor characteristics.

After passing this rigid test, the compressor assembly is pressed into the shell and the end head welded in to give a hermetic assembly. This welding is done on Westinghouse automatic arc welders developed especially for this job.

The end head is dome shaped and also has a spot welded disc in the center. First we found by exhaustive tests that this shape of end head had very beneficial qualities from a noise standpoint. We also found that the center of the head emitted certain vibrations, which if deadened resulted in a lower overall noise level. One of our engineers discovered that a small disc with radial slits gave this effect.

The plate condenser consists of a single heavy sheet of metal with a long, serpentine shaped steel tube, copper brazed to the sheet. With this type of construction we get no leaks, no dirt, and a strength of over 8,000 lbs. per square inch. We also are able with this type construction to regulate the distribution of refrigerant, thereby obtaining an efficient use of our surface and material. Another advantage is that no condenser cleaning is required.

THE MOISTURE PROBLEM

It is necessary to remove all traces of water from the system before it is charged with oil and refrigerant. We refer to this operation as dehydration and this is a most vital element in our processing.

The unit must be absolutely free of moisture for many reasons. In the first place water and "Freon-12" refrigerant do not mix. Any moisture present will circulate through the system and eventually come to a low temperature region where the water will freeze out in the form of ice to block passages. This usually occurs in the small bore capillary tube and makes the system inoperative due to a clogged passage.

The other major difficulty resulting from the presence of moisture can be classified under the broad subject of corrosion. Corrosion results in clogging of the capillary, clogging of the screens, excessive deposits on valves that prevent proper seating, break down of the oil, deterioration of the motor winding, and actual sticking of the moving parts in the compressor.

AIR & HEAT AS DRIERS

Another principle which Westinghouse has strictly adhered to on household units is to dehydrate the complete unit assemby and not component parts. This avoids the hazard of introducing moisture when assembling separately dehydrated sub-assemblies.

We dehydrate with air and heat. We have found that the use of air adapts itself more readily to quantity production; is more simple and economical. Also, as you will see by the discussion which follows, the air method assures a positive dehydration and a 100% control of the moisture content of all units.

First let us discuss the dehydration circuit, or in other words, the air path through the unit. Air enters the motor end of the compressor shell, passes over the motor, through the cylinder and valve assembly, and out of the discharge connection. Then a portion, approximately 5% of the air passing through the compressor, is bled off through another path going through the condenser, capillary tube, and evaporator to atmosphere.

This type of circuit gives us a positive check on the absence of clogged connections prior to dehydration. This is a very important feature as without this type of circuit it would be impossible to detect clogged soldered joints until after the system is charged with oil and "Freon."

Nine of these units are connected in series and placed in the dehydrating ovens which are maintained at 257° F. This temperature assures the elimination of moisture and is also low enough to prevent cellulose deterioration.

HOW DRIERS WORK

Our practice is to control the inlet air pressure at a definite and low value. The low pressure prevents the possibility of cellulose deterioration at the high temperature. Close control of the inlet air pressure limits the amount of air which can be introduced to the series.

The outlet airflow from the ninth unit is controlled as to minimum quantity. This assures that the correct amount of air is passing through all units, that the connections are tight and that none of the joints are clogged.

If the temperature is controlled as specified and the units are left in the ovens for the specified time, we are assured of positive dehydration regardless of moisture content in the beginning.

We know the above statement to be true from experience but we go one step further to obtain an absolute check on each unit. As would be expected, the ninth unit in the series which passes all of the moisture from the preceding eight units would be the wettest at any given time.

Therefore, at the end of the dehydrating period the ninth unit is disconnected from the series and evacuated through the equivalent of a liquid air trap and checked for moisture content. The moisture content limits are rigid and assure a wide margin of safety.

Air for dehydration purposes is dried in calcium chloride and potassium hydroxid dryers. It so happens that this particular type of air drying system was installed several years ago. Equally satisfactory results can be obtained with activated alumina or silica gel. Our specifications call for air which must not exceed a dewpoint of 58° F.

We have developed at Springfield a unique method of testing the units before they are released for installation in the cabinets. Several years ago we used to place an insulated box around the evaporator of each unit and test the units for temperature and running time.

TEST CONDITIONS

Now we have developed a special performance room which is carefully controlled for temperature at 86 + or —2° F. and for humidity at 47 + or —3% relative humidity. This controlled temperature and humidity gives a constant load on each size of evaporator and a fixed temperature for cooling of the compressor and condenser.

Units are operated in this room for approximately three hours under both continuously operating and cycling conditions. By the appearance of the evaporator frost we are able to determine that the unit is operating correctly and that the refrigerant charge is of the correct amount. The units pass through this room on an electrified conveyor and readings of watts are taken automatically. Checks are also made for low voltage starting and high voltage starting to make sure that the unit is functioning properly under a wide range of voltages. A voltage test for electrical insulation is also made automatically.

Next the units pass through what we have termed our "Quietorium." This is a specially constructed sound proof room which has just been added to our inspection facilities.

GUARANTEED . . . .

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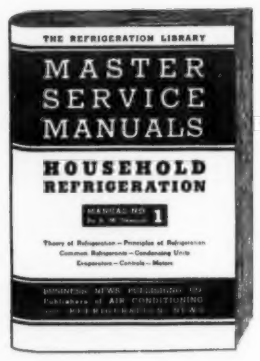

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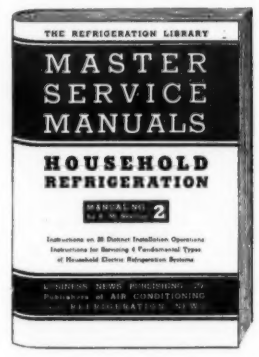

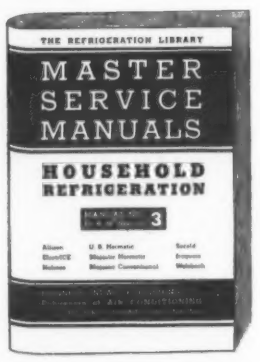

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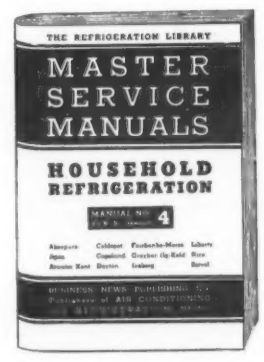

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Market For Farm Refrigeration Units Widens Rapidly In Texas

Food Freezing and Storage Facilities Loom Large In Modern Texas Farm Economy

AUSTIN, Tex.—Rapid development of the use of mechanical refrigeration equipment for the freezing and storage of food on Texas farms was outlined in a paper delivered by P. T. Montfort, research associate of the agricultural enginering department of Texas A. & M. College, at the Food Preservation Conference held at the University of Texas here recently.

"Texas farm people are refrigeration minded," Mr. Montfort declared. "They have learned by bitter experience that the high natural temperatures prevalent in the state are far from ideal for satisfactory food preservation. They have become accustomed to seeing refrigeration in daily use in the processing, transportation, and distribution of a wide variety of perishable products.

"Many Texas farmers, in spite of the low average farm income which aggravates the problem of financing equipment, are today using mechanical refrigeration equipment operated with gas, kerosene, or electricity. Recent studies indicate that in areas where electricity has been available for as much as two years more than 50% of the farms are now using electric refrigerators.

NEW RURAL LINES HELP PAVE THE WAY

"Extension of electric lines into rural areas of Texas during the past two decades has made low cost electricity available to more than 70,000 farms. This expansion is going ahead at the present time at the rate of some 20,000 to 30,000 farms annually.

"Improvement in small automatic electrically operated mechanical refrigeration equipment has made available to the farm a convenient, economical, and efficient means of providing low temperatures for the preservation of meats, fruits, vegetables, dairy, and poultry products until they can be consumed on the farm or marketed to best advantage.

"Rapid development of the commercial quick-freezing industry and locker storage facilities has created among Texas farmers a widespread interest in the use of low temperature storage. They visualize tremendous possibilities for a better utilization of farm resources to improve the diet of the farm family and to increase the net income from many productive enterprises on the farm.

WIDE VARIANCE IN TEMPERATURE

"Temperature requirements for refrigeration on individual farms will vary widely depending upon a number of factors such as the type of farm, size of family, kind of commodity to be stored, and length of storage period. These requirements will, however, usually fall within two general classifications:

"First of these is the chilling and storing at above-freezing temperatures (usually 32 to 40°F.) of products such as milk, eggs, meats, fruits, and vegetables which are to be consumed at home or sold within a few days or at most within one or two weeks, and also of products such as beef to be aged, pork to be cured, and certain vegetables such as potatoes, carrots, and turnips requiring relatively long periods of storage at temperatures above freezing.

"Second classification is that of products such as meats, fruits, and vegetables to be frozen at temperatures of 0 to —40° F. and stored for relatively long periods of time at a temperature of approximately 0° F., either for consumption on the farm or for market.

"The following discussion will be confined to the facilities and equipment now available for processing, freezing, and storing food for consumption by the farm family.

"It is assumed that a large part of the food utilized will be produced on the farm. However, it is possible that some farmers, especially in the higher income brackets, may purchase products to be processed or may purchase commercial frozen foods in large quantities at a considerable saving.

"It is extremely difficult to estimate the amount of frozen food to be utilized on the individual farm. This will vary widely depending upon the size of the family, food habits, and availability of products suitable for freezing.

FROZEN FOOD DIET SUGGESTIONS

"The amount of frozen food (1,460 pounds per year) suggested by the Texas State Nutrition Committee as desirable for an adequate diet for a farm family of five is more than twice the amount being processed today in the locker plants of Texas.

"No single type or size of refrigeration equipment will meet the widely divergent needs of farm families in Texas. A number of manufacturers, agricultural colleges, and other agencies are at present devoting considerable effort to the development of equipment which will meet these needs at a cost which will make the use of the equipment possible and profitable to the farmer.

"It appears now that this development is rapidly falling into well defined trends, each possessing certain advantages and disadvantages when used under specific conditions.

VARIETY OF METHODS USED

The more common practices are:

"(a) Using the central locker plant for processing, freezing, and storage, with no refrigeration equipment on the farm.

"(b) Using the central locker plant for processing, freezing, and storing, and using the standard household refrigerator with oversize freezer compartment (2 to 10 pounds capacity) for storing a few days' supply at the farm.

"(c) Using the central locker plant for processing, freezing, and storage, and the household refrigerator with large (1 to 6 cu. ft.) freezer compartment which will hold one to two weeks' supply of frozen foods on the farm. The large freezer compartment in this type of refrigerator is suitable for freezing small quantities of products on the farm.

"(d) Using the individual farm freezer chest (2 to 30 cu. ft.) for freezing and storage on the farm, with some chilling and freezing done at locker plant in summer months.

"(e) Using the all-purpose farm refrigerator which has facilities for chilling, freezing, and storage at the farm."

'FARM REFRIGERATION MERELY IN INFANCY'

Mr. Montfort then went on to detail the advantages and disadvantages of these various systems, the cost of the equipment involved, and the estimated cost of freezing and storing 1,500 pounds of food for a family of five under each of these arrangements.

In conclusion, Mr. Montfort stated that: "The design, manufacture, distribution, and application of low temperature refrigeration equipment for the farm is in its infancy. The possibilities are almost unlimited, yet there is need for much careful research. Sound progress to date gives reasonable assurance that we may expect tremendous development and expansion within the next few years."

S & S Locker Plant Serves Two Masters

JEFFERSON CITY, Mo. — The S & S Locker Plant here is playing both ends from the middle—and doing a nice job of it, too.

Located right in the heart of this city's downtown district as a concession to urban trade, the plant features at its "back door" a spacious truck dock for the convenience of rural dwellers. And both classes of locker renters are responding to this strategic compromise with increasing patronage, the management reports.

As a further inducement to farm folks, the S & S plant makes available its portable smoking outfit for the processing of country ham and sausage.

Special provisions also have been made for the storage of all sorts of game, and meat from moose, deer, bears, and fowl have already been frozen and placed in the plant's lockers.

Builder of the plant was John Tenge, Frigidaire commercial division manager in St. Louis.

Utility Man Analyzes Texas Locker Industry

AUSTIN, Tex. — Surveying the progress of the frozen food locker industry in the state of Texas, J. W. Stockham of Texas Power & Light Co.'s Dallas headquarters reported to the food preservation conference held here recently at the University of Texas that "there are over 100 modern locker plants in Texas, approximately 10% of which were erected in 1938, 11% in 1939, 75% in 1940, and the remaining 4% being built or in process of erection this year."

Most of these plants, Mr. Stockham explained, are located in small towns —more than half of them in towns of less than 5,000 population. He estimated the cost of constructing a complete service locker plant of 300 to 500 lockers at $35 per locker if the plant is installed in an existing building, or $50 per locker if a new building has to be erected.

"A complete service locker plant in Texas," he said, "is one that is equipped to give the following service: (1) ample parking space at all times; (2) side or rear entrance for carcasses that can be quickly weighed and inspected; (3) complete chill room in which carcasses can be stored immediately after weighing and inspecting; (4) complete system for dispatching, hauling, and recording all incoming products through the plant; (5) aging, processing, curing, sausage making, smoking, lard rendering, locker rentals, and retail sales of the best sellers among ready packaged frozen foods; (6) either an abbatoir or slaughtering arrangements with responsible parties; (7) hauling should be optional, depending upon the locality; (8) ladies processing room service with hot and cold water, blanching outfits, waxed cartons, hot plates, paper towels, soap, rubber aprons, utensils, furniture, cold drink dispenser, and electric garbage grinder should be considered as optional, and depending upon the community in which the plant is located."

Locker rentals in Texas range from $9 to $15 per locker, Mr. Stockham pointed out, and processing charges vary from 1½ to 2 cents per pound. Curing fees average 2 cents per pound, and haulage charges about 10 cents per mile, he reported.

Yea and Nay on Neb. Locker Laws

New Law Makes Possible Municipal Ownership

LINCOLN, Neb. — The Nebraska legislature has passed Bill No. 69 which authorizes cities of the second class and villages to establish and maintain cold storage locker or refrigeration plants, in cases where no privately owned plants exist.

The new law provides that the cost of such cold storage facilities may be defrayed by the levy of a tax of not to exceed one mill on the dollar of the actual valuation of all property within the corporate limits of the city or village in question. If this tax is insufficient, the cost may be defrayed by the issuance of municipal bonds if approved by the voters.

The aggregate amount of bonds that may be issued for the purpose of establishing and maintaining such a plant shall not exceed 5% of the actual valuation of all the property in said city or village subject to taxation.

Management of the plant and the rates to be charged, manner of payment, and service to be furnished will be outlined and provided by ordinance. In municipalities maintaining a system of waterworks and having a water commissioner, the latter will have charge of the plant, unless otherwise provided by ordinance.

Insurance Men Invest In 300-Locker Plant

GATESVILLE, Tex. — Mounce & Jones, local insurance men whose experience in that line should make them fairly well qualified to judge business risks, apparently have decided that the locker plant business presents excellent profit possibilities.

The men have awarded contracts to Air-Con Engineering Corp. of Waco, Tex. for construction of a 300-locker frozen food storage plant here. They report that with the building still under way more than 200 lockers already have been rented. Plans have been prepared for an anticipated expansion to 500 lockers.

Management of the plant is to be placed in the hands of a veteran meat merchandiser of this city. The insurance men will have offices for their business housed in the locker plant building.

Florida Plant Caters To Market Storage Needs

ORLANDO, Fla. — Dixie Frozen Foods & Storage Co. was opened here recently by Harry McDonald, president of the firm, and Edward Cummings, an experienced freezer plant operator.

Equipped with facilities for refrigerated storage of more than 250,000 lbs. of produce, the plant will cater to the storage needs of large fish markets, dairies, and butcher shops.

The plant consists of compressor room, quick-freeze room, and cold storage room. The quick-freeze room is insulated with 9 inches of cork, the storage room with 6 inches. Auxiliary diesel equipment has been provided to keep the compressors running in case of power failure.

Plant Regulatory Bill Killed By Legislators

LINCOLN, Neb. — The Nebraska legislature's committee on agriculture has killed the frozen food locker storage regulatory bill sponsored by the Nebraska locker association and introduced by Senator Richard N. Johnson of Fremont.

Locker plant operators in the state, however, are planning to continue the fight for what they consider necessary regulation in the next session of the legislature, officials of the state locker association indicated.

Patterned closely after the Wisconsin regulations, the defeated Nebraska bill would have established minimum standards of operation and would have provided for a licensing fee to be used for financing a periodic plant inspection service.

Food Scientists Named To Joint Locker Group

DES MOINES, Iowa—Appointment by the Institute of Food Technologists of two of its members to serve on the Joint Committee on Frozen Food Locker Plants has been confirmed by S. C. Prescott, president.

The two men named are: B. E. Proctor, associate professor of food technology, Massachusetts Institute of Technology; and H. C. Diehl, chief of the commodity processing division, Bureau of Agricultural Chemistry & Engineering, Western Regional Research Laboratory, Albany, Calif.

Douglas County Plant To Have Big Parking Lot

VILLA GROVE, Ill.—A 250-locker frozen food storage plant is being constructed here for the Douglas County Locker Service. E. F. Cook of Tuscola, Ill. is supervising the work. Property on which the plant is located consists of two lots, one for the building itself and one for a parking lot.

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Service Men 'Act Up' at Spring Party of McQuay & Vincent

When Twin Cities chapter of the Refrigeration Service Engineers Society met recently the entertainment was programmed under the title "Anyone Can Be An Actor"—so the boys went ahead and almost proved it. Left to right Pat Webster of radio station WCCO artist bureau and the cast of the "Face on the Barroom Floor Production," including Lars Berheim, Rex Ashcroft, and Gene Coulter of the Twin Cities Chapter; and Elizabeth Lindstrom of Vincent Brass & Copper Co.

* * *

MINNEAPOLIS — Refrigeration service men turned actors for a night at the "spring party" held March 18 at the plant of McQuay, Inc. here and sponsored by Vincent Brass & Copper Co., refrigeration supplies jobber. More than 100 service men, including members of the Twin Cities chapter of Refrigeration Service Engineers Society, attended the affair.

A conducted tour through the McQuay coil manufacturing plant preceded a brief business meeting by R.S.E.S. members, directed by Arthur Palen, president. William Hauber of Vincent Brass & Copper presented a short discussion of refrigeration equipment.

Entertainment feature of the evening was the "Anyone Can Be An Actor" program conducted by Pat Webster of station WCCO's artist bureau. Rex Ashcroft, Gene Coulter, and Lars Berheim, R.S.E.S. members, and Miss Elizabeth Lindstrom of Vincent Brass & Copper were chosen as members of the cast, and under Mr. Webster's direction acted out a skit which packed plenty of laughs for those present.

A buffet Dutch lunch wound up the evening's program. Mr. Hauber acted as master of ceremonies for the affair.

Philco Adds Window Ventilator To Line

PHILADELPHIA — New window type room ventilator with capacity of 475 c.f.m. has been introduced by Philco Radio & Television Corp. Housed in a walnut wood cabinet and weighing 26 lbs., the unit can be installed in any standard double-hung sash window in 30 minutes, it is claimed. Only connection needed is plugging into an electric socket.

Another Message
To you men who read the News

'over somebody else's shoulder'

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The Service Man's Notebook

By Henry Kronke

Mr. Kronke, a service engineer in New York City, compiles useful, handy data for use in his work as he finds a repeated need for certain kinds of information. The editors suggest that service and installation engineer readers of the NEWS cut these tables out for their own notebooks.

HEAT LEAK AND SERVICE LOAD FOR REFRIGERATORS; HEAVY SERVICE; B.T.U. PER DAY PER SQ. FT. EXT. SURFACE

T.D. °F.	Insulation Corkboard or Equivalent 2"	2½"	3"	3½"	4"	5"	6"	Glass 1	2	3	4
1°	4.344	4.032	3.744	3.528	3.336	3.072	2.856	28.46	12.38	8.30	6.38
20°	86.88	80.6	74.8	70.5	66.7	61.4	57.1	569	248	166	128
30°	130.3	120.9	112.3	105.8	100.0	92.1	85.6	854	372	249	192
40°	173.8	161.2	149.7	141.1	133.4	122.8	114.2	1139	495	332	255
50°	217.2	201.6	187.2	176.4	166.8	153.6	142.8	1423	619	415	319
60°	260.6	241.9	224.6	211.6	200.1	184.3	171.3	1708	743	498	383
70°	304.0	282.2	262.1	246.9	233.5	215.0	199.9	1992	867	581	447
80°	347.5	322.5	299.5	282.2	266.8	245.7	228.4	2277	991	664	511
90°	390.9	362.8	336.9	317.5	300.2	276.4	257.0	2562	1115	747	575
100°	434.4	403.2	374.4	352.8	333.6	307.2	285.6	2846	1238	830	638
110°	477.8	443.5	411.8	388.0	366.9	337.9	314.1	3131	1362	913	702

In the above table the service factor is 0.042 B.t.u./sq. ft./hour/degree F.

HEAT LEAK AND SERVICE LOAD FOR REFRIGERATORS; NORMAL SERVICE; B.T.U. PER DAY PER SQ. FT. EXT. SURFACE

T.D. °F.	Corkboard Insulation or Equivalent 2"	2½"	3"	3½"	4"	5"	6"	Glass No. 1	2	3	4
1°	4.008	3.696	3.408	3.192	3.0	2.736	2.52	28.128	12.048	7.968	6.048
20°	80	74	68	64	60	55	50	563	241	159	121
30°	120	111	102	96	90	82	76	844	361	239	181
40°	160	148	136	128	120	109	101	1125	482	319	242
50°	200	185	170	160	150	137	126	1406	602	398	302
60°	241	222	205	192	180	164	151	1688	723	478	363
70°	281	259	239	223	210	192	176	1969	843	558	423
80°	321	296	273	255	240	219	202	2250	964	637	484
90°	361	333	307	287	270	246	227	2532	1084	717	544
100°	401	370	341	319	300	274	252	2813	1205	797	605
110°	441	407	375	351	330	301	277	3094	1325	877	665

In the above table the service factor is 0.056 B.t.u./sq. ft./hour/degree F.

Charge of $1.50 For 'Looking' Is Part of 'Honesty' Policy

NORTH HOLLYWOOD, Calif.—He charges $1.50 just to look at a repair job, he gives 24-hour service but won't employ a helper, he doesn't sell equipment, and he sometimes tells customers that the factory service man can do the job more cheaply—that's F. M. Wright, who operates Wright's Refrigeration & Appliance Service here, covering the entire San Fernando valley. And he's so busy that he hasn't had a vacation in years.

After some service men he knew lost their heavy investments, Mr. Wright began the hard way, borrowing enough to buy a car, but today he has working agreements with several dealerships.

"Twenty-four Hour Wright Way Refrigeration Service," as his telephone directory advertisement has it, means Mr. Wright himself. Volume of his business warrants a helper, but experience has taught him that helpers are headaches, he says. When one gets on a job he becomes his own boss, and then, right or wrong, the employer must support his decisions, often at considerable expense or the danger of losing a customer.

Mr. Wright turns down an average of 10 calls a week because he won't make free estimates on repairs. He's found that all too often quotations become bids, with the lowest estimate getting the work. Since his charges are not the lowest and to prevent loss of time and travel costs, he sets a flat rate of $1.50, provided the call is nearby, to inspect equipment.

The inspection fee, however, is applied against the cost of repair work if Mr. Wright gets the job. Customers apparently consider this a guarantee that he'll do a satisfactory job, for they usually give him the "go ahead" sign. In the event Mr. Wright makes minor repairs and within 30 days a complete overhaul or extensive repairs are necessary, he applies the original charge against this cost.

When he thinks a unit cannot be repaired satisfactorily—the equipment is obsolete or "too far gone"—Mr. Wright tells the customer so, explaining why. Then his inspection charge is applied on the purchase of a new refrigerator, provided it is bought through one of the "cooperating" dealers.

Mr. Wright sells no equipment. He turns a lead over to the dealer from whom the present unit was purchased—if that dealer has a working agreement with him. Otherwise the lead goes to the dealer in that area with whom he works.

As another step in his policy of "complete honesty," Mr. Wright tells his customers when a manufacturer's own service department would do a repair job less expensively than he could. In an emergency he tides the customer over without making it a costly operation until the manufacturer's service man can arrive. This is an excellent goodwill builder, Mr. Wright believes, for these people generally have friends to whom they recommend him.

★ ★ ★ ★ ★ ★ ★ ★ ★

MILLS MIGHTY REFRIGERATION

Mills Condensing Units
By Mills Novelty Company
4100 Fullerton Ave., Chicago, Ill.

★ ★ ★ ★ ★ ★ ★ ★ ★

Arkadelphia, Ark. Dealer Gets A New Store

ARKADELPHIA, Ark. — Caldwell Electric Co., Frigidaire dealership, has moved into a new store at 607 Clinton St. J. A. Caldwell, Jr. is owner.

DRYNESS

You get it in WOLVERINE TUBING

—Buy From Your Jobber—

WOLVERINE TUBE CO. DETROIT

CLASSIFIED ADVERTISING

RATES: Fifty words or less in 6-point light-face type only, one insertion, $2.00, additional words, four cents each. Three consecutive insertions, $5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Air Conditioning & Refrigeration News, 5229 Cass Ave., Detroit, Mich.

POSITIONS AVAILABLE

NATIONALLY known manufacturer of commercial refrigerators wants the right traveling field executive to supervise, coordinate, and develop sales in northeastern U. S. Will pay high salary, with bonus possibility, and all expenses. State age, experience, and all qualifications. Apply Box 1318, Air Conditioning & Refrigeration News.

FRANCHISES AVAILABLE

JOBBER distributors wanted for the famous Multiplex Dispenser for soda, seltzer, coca cola, ginger ale, etc. The Multiplex fixture dispenses seltzer at 1¢ per gallon, other drinks at 1½¢ each. MULTIPLEX FAUCET CO., manufacturers of dispensing fixtures for 35 years, 4319 Duncan Ave., St. Louis, Mo.

GENERAL Refrigerator Company is announcing the new 1941 line. General Display Cases, Reach-In Cabinets, Walk-In Coolers and Beer Pre-Coolers. For almost half a century we are manufacturers of the highest quality commercial refrigerators. Compare with other higher priced lines. Write in for prices and discounts on the biggest money making line in the country. GENERAL REFRIGERATOR CO., 5th & Bainbridge Sts., Philadelphia, Pa.

SELL refrigerator display cases, walk-in coolers, reach-in refrigerators, refrigerating units, to meat markets, grocers, taverns, etc. Financing arrangements to help sell. Write for full information or see EHRLICH REFRIGERATOR MFG. CO., St. Joseph, Mo., Dept. A.

BUSINESS OPPORTUNITIES

REFRIGERATION Supply Jobber Business—Sickness compels sale, successful going jobbing business. Established over six years; large productive trade area. Well equipped, centrally located store. Clean fast moving inventory, stocks of leading lines, exclusive on many. Large clientele, repeating satisfied customers. Box No. 1320, Air Conditioning & Refrigeration News.

EQUIPMENT FOR SALE

REBUILT and "as is" refrigerators and vacuum cleaners. Rebuilt refrigerators guaranteed for 30 days. Rebuilt vacuum cleaners guaranteed for one year. All merchandise guaranteed to look and operate like new. Send for latest catalog. MERCHANDISE TRADING CO., 147 W. 42nd St., New York, N. Y.

HERE IT IS! Three catalogs in one. General Electric, Westinghouse, Majestic, Grunow Hermetic Units and compressors. Frigidaire, Kelvinator, Norge, Crosley, etc., compressors, evaporators, and parts. Complete line refrigeration parts, tools, and supplies. Write for your copy on your letterhead. SERVICE PARTS CO., 1101-3 N. 24th Ave., Melrose Park, Ill.

REPAIR SERVICE

CONTROL REPAIR Service. Domestic controls reconditioned equal to new at a small cost. All work guaranteed for one year. Prices upon request. UNITED SPEEDOMETER REPAIR CO., INC., 342 West 70th Street, New York City.

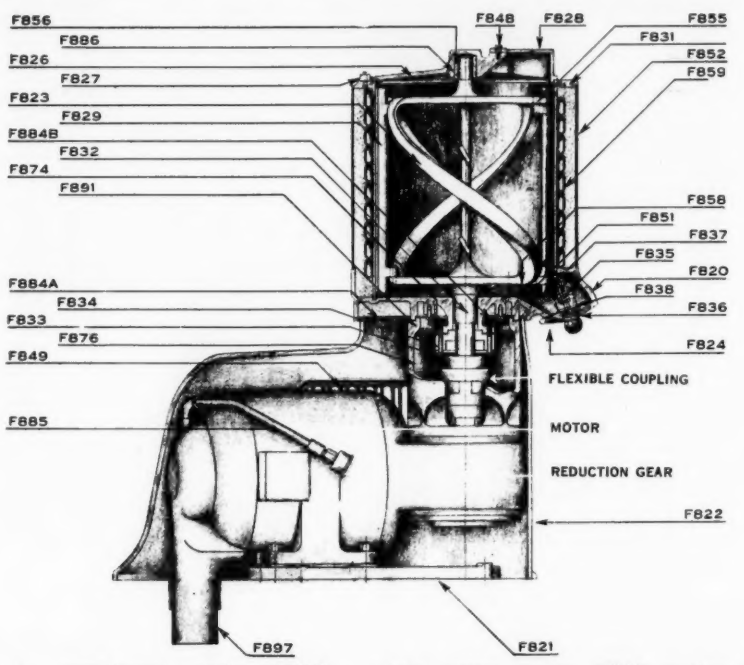
CONTROL REPAIR service. Your controls repaired by expert mechanics, with special precision equipment. Supervised by graduate engineers. We stress perfection and dependability before price. One year guarantee on domestic controls. Any bellows operated device repaired. HALECTRIC LABORATORY, 1793 Lakeview Road, Cleveland, Ohio.

Burnishing Tool Will Reduce Brush Failure

CLEVELAND — Burnishing tool designed to remove the high resistance film on commutators and rings, thereby reducing uneven wear and brush failures, has been introduced by Ohio Carbon Co.

The burnisher, mounted in a wooden handle, is held firmly against the commutator, until the film or glaze is removed. It can occasionally pull out material deposited in slots, the company claims, but it is not designed to reduce high mica, flat or burned spots, for which a stone is necessary. The tool is available in sizes from 1¼ to 20 inches long.

Fig. 30—Parts of Tuthill 2½ Gal. Freezer



Key to numbered parts: F820—freezer base, F821—motor base, F822—motor housing, F823—dasher frame, F824—draw-off gate, F826—freezer cover, F827—cover lug, F828—filler hole cover, F829—scraper blade, F831—inner shell, F832—drive shaft, F833—cover plate.

F834—fibre oil retainer, F835—draw-off gate spring, F836—draw-off gate lock pin, F837—draw-off gate washer, F838—draw-off gate nut, F848—filler hole cover screw, F849—motor housing side plates, F850—gasket, F851—bottom scraper blade, F852—outer shell, F855—dowel pin, F856—dowel pin, F858—rivet (dasher frame).

F859—copper tube, F874—gasket, F876—adapter bracket, F884-A—insulation cover, F884-B—insulation cover, F885—grease cup pipe, F886—bushing, F891—adapter bracket and freezer base gasket, F897—motor shroud.

Operating and Service Methods For Dry-Expansion Counter Freezers

By Arch Black and Dean C. Seitz

Editor's Note: This article continues the information on Tuthill 2½ and 5-gallon counter-type ice cream freezers, and is one of a series of articles on the servicing of counter freezers which have been appearing in issues of AIR CONDITIONING & REFRIGERATION NEWS in the past several months.

Service Notes on Tuthill Freezers

Figs. 30 and 31 are cross-sections of the 2½-gallon and the 5-gallon Tuthill freezers. Also, listed below each freezer is the description of the various parts following the part number.

The reader through the knowledge obtained in earlier articles and by carefully studying these two diagrams can readily ascertain the principles of the Tuthill freezer and just how it differs from those previously explained. With this knowledge, only certain remarks need be made for servicing points as they would apply to the Tuthill freezers.

Extreme care should be taken not to damage the contact surfaces of the drawoff gate at the mouth of the freezer, and attention should be called to the necessity of handling the drawoff gate with extreme care. Any damage to either of these surfaces will result in ice cream leaking from the freezer.

If the drawoff gate is found to leak, the leak may be due to one of two causes. If a slight pressure exerted against the drawoff gate to hold it more securely against the mouth of the freezer will stop the leak, this would indicate that the tension of the springs holding the drawoff gate against the freezer is not sufficient.

It may be found that the nuts securing the springs have become loose, or, if these nuts are tight, then it may be assumed that the springs have lost their tension and should be replaced.

If additional pressure against the face of the drawoff gate as mentioned above does not stop the leak, then it will probably be found that the surface of either the drawoff gate or the mouth of the freezer has been damaged. To overcome this condition it is necessary to lap the drawoff gate against the mouth of the freezer, using any good commercial lapping compound.

In cases where these parts are found to have been damaged, the user of the machine should be cautioned against rough handling of these parts and this same caution should be applied as well against the cover and the dasher frame as these parts also can be easily damaged by rough handling.

Under the heading of lubrication of the freezer unit, it has been pointed out that if this shaft should not be regularly lubricated the mix from the freezer may find its way into the grease tube leading to the freezer shaft, and in time will solidify.

In such an event attach small drill to wire and drill out obstruction in grease tube. Caution the user that this condition has been caused by failure to regularly lubricate the freezer shaft and that obstruction is caused by accumulation of mix in the grease tube solidifying.

OPERATING THE FREEZER

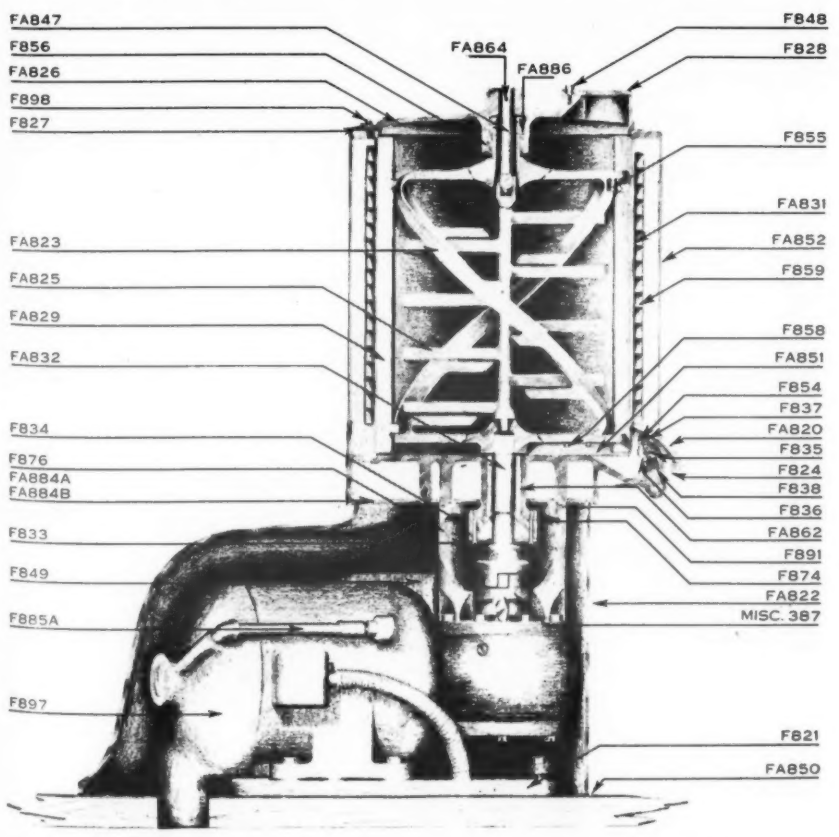
Bearing in mind that which has already been written on operating instructions before starting to freeze, the hardening cabinet should be at least below 0° F.

After pouring in the mix through the funnel which should be placed in the filler hole and is on top of the Tuthill freezer (this varies from previous freezers explained in that the filler hole is in front), remove funnel and close cap. Start dasher motor and open refrigeration valve. When switch used to start dasher motor is down, this automatically starts compressor motor.

After five to six minutes have elapsed, test the consistency of the cream by drawing through the drawoff gate into a large spoon or small receptacle, returning the sample through the filler hole.

Close the refrigeration valve when cream reaches 24° F. This generally takes from six to 10 minutes.

Fig. 31—Parts of Tuthill 5-Gal. Freezer



Key to numbered parts: FA820—freezer base, F821—motor base, FA822—motor housing, FA823 — dasher frame, F824—draw-off gate, FA825—beater paddle, FA826—freezer cover, F827—cover lug, F828—filler hole cover, FA829—scraper blade, FA831—inner shell, FA832—drive shaft.

F833—cover plate, F834—oil retainer, F835—draw-off gate spring, F836—draw-off gate lock pin, F837—draw-off gate washer, F838—draw-off gate nut, FA847—shaft extension, F848—filler hole cover screw, F849—motor housing side plates, FA850—gasket.

FA851—Bottom scraper blade, FA852—outer shell, F854—dowel pin, F855—dowel pin, F856—dowel pin, F858—Rivet (dasher frame), F859—copper tube, FA862—bushing, FA864—dowel pin, F874 — gasket, F876 — adapter bracket.

FA884-A—insulation cover, FA884-B—insulation cover, F885-A—freezer motor extension pipe, FA886—bushing, F891—Adapter bracket and freezer base gasket, F897—motor shroud, F898—cover lug screw, Misc. 387—coupling.

Schmidt Bros. Open New Branch In Texas

NEEDVILLE, Tex. — Victor and Earnest Schmidt, owners of the Schmidt Bros. Home Furnishings store in Rosenberg, have opened a branch here. Charlie Stavinoha will be manager. The store carries a complete line of Westinghouse appliances, and the Schmidt Bros. hope to cash in on the recent extensions of rural electricity in this area.

Home Furniture Adds Crosley Refrigerators

DALLAS, Tex.—Home Furniture Co., which last year started merchandising Westinghouse electric refrigerators, now has added the Crosley refrigerator line. Both lines are being promoted through the medium of a joint window display. E. B. Spain is in charge.

National Enameling Has Net of $220,106

MILWAUKEE—Net profit for 1940 of $220,106 was reported by National Enameling & Stamping Co., compared with a net loss in 1939 of $100,699.

Sales in 1940 amounted to $9,510,580, an increase of 10% over 1939 and 23% over 1938.

Dividends which had been stopped in 1937, were resumed in 1940 with a payment of $57,137.

Delaware Business Men Seek Fair Trade Law

WILMINGTON, Del. — John S. Reburn, local electric refrigerator and appliance dealer, and a past president of the Electrical Trades Association, has been named to head a committee of the Brandywine Business Men's Association to support a fair trade bill pending in the State Legislature.

Delaware is now one of only four states without fair trade statutes.

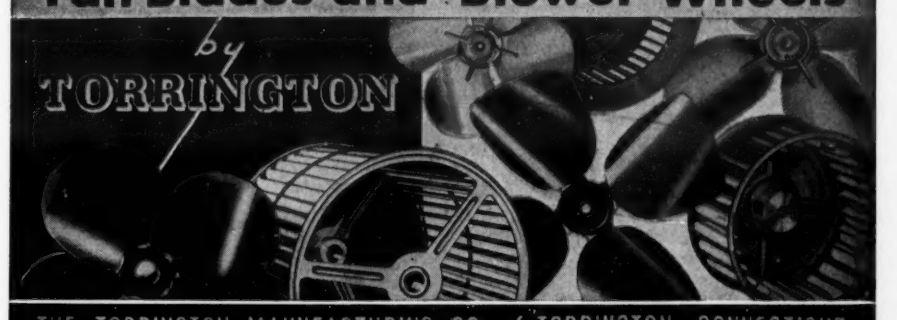
YES SIR! THIS Sherer LINE IS A PROFIT MAKER
I'm satisfied with it in every respect!

"I changed over to the Sherer line a year ago and have never regretted it for one minute," says one Sherer producer. You, too, can make sure of *your* share of 1941's extra business by selling Sherer's complete line of display and storage refrigerators, backed by closely-knit factory cooperation.

Write today for complete franchise details concerning the Sherer line.

Sherer-Gillett Co. MARSHALL, MICH.

Fan Blades and Blower Wheels
by TORRINGTON



THE TORRINGTON MANUFACTURING CO. of TORRINGTON, CONNECTICUT

INCREASE YOUR PROFITS WITH TYLER'S

★ Stores, restaurants, hotels, bars, taverns—all are potent prospects for bigger sales and profits when you carry the complete 1941 Tyler line. Fast-selling Reach-In Boxes, Vegetable Display Cases, Meat and other Display Cases meet every need. Write:

TYLER FIXTURE CORP., Dept. R-4, NILES, MICH.

TYLER DEALERS ARE MAKING MONEY!

Tyler Reach-Ins. Many sizes and door arrangements.
Refrigerated Vegetable Display. 6 or 9 ft. sizes.
Meat Display Cases. Top Display and Double Duty.

RANCO Type G2
Commercial Controls

Fully proven in field service! One of the most popular commercial controls ever built - - because of simple, sturdy construction, high capacity and wide range of applications possible. For pressure or temperature - - or in combination with high-pressure cut-out. A typical Ranco value!

Ranco INC.
COLUMBUS. OHIO. USA

NEW!
Write for this new Refrigeration Control Catalog today! White-Rodgers Electric Co. 1211 Cass Ave. St. Louis

DISPLAY CASES
Write for details of this sensational new 100% PORCELAIN Display Case line.
MIDWEST MFG. COMPANY
Galesburg, Illinois

LET US SOLVE YOUR
COIL PROBLEMS
MARLO COIL COMPANY
SAINT LOUIS, MISSOURI

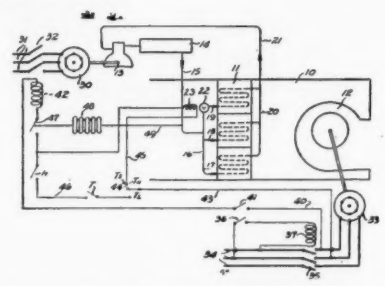
BUNDY TUBING
ENGINEERED TO YOUR EXPECTATIONS
BUNDY TUBING CO., DETROIT

Specify and Buy fedders
REFRIGERATION Products
FEDDERS MFG. CO. BUFFALO, N. Y.

PATENTS

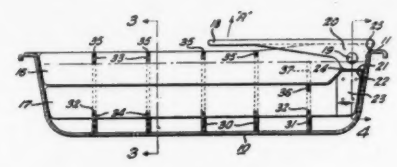
Issued In February 1941

2,230,422. AIR CONDITIONING APPARATUS. Reginald G. Wyld, Dayton, Ohio, assignor, by mesne assignments, to Chrysler Corp., Highland Park, Mich., a a corporation of Delaware. Application Aug. 7, 1937, Serial No. 157,932. 2 Claims. (Cl. 62—6.)



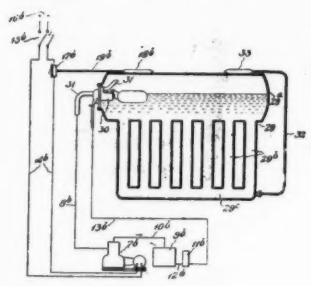
1. An air conditioning system comprising a compressor-condenser-expander refrigeration system including a single compressor of fixed capacity and a plurality of expander coils served by said compressor and arranged in parallel with each other, an air conditioning unit comprising a cabinet and air moving means in said cabinet, said expander coils being arranged side by side as a bank of coils extending across the interior of the cabinet so that each of said expander coils is in the path of a part only of the total stream of air moved through the unit by said air moving means.

2,230,525. FREEZING TRAY. Ralph H. Chilton, Dayton, Ohio, assignor to General Motors Corp., Detroit, Mich., a corporation of Delaware. Application Dec. 27, 1937, Serial No. 181,940. 15 Claims. (Cl. 62—108.5.)



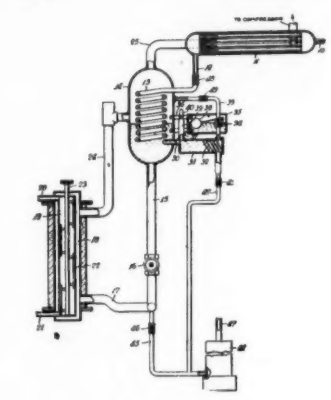
1. In a freezing tray, a container pan, a grid for dividing the pan into a plurality of ice block compartments, said grid comprising: a longitudinal wall having substantially aligned relatively movable upper and lower sections, a plurality of transverse walls mounted upon said longitudinal wall so as to permit substantial relative lateral motion and relative vertical motion between said upper and lower sections.

2,230,842. REFRIGERATING APPARATUS. Edward M. May, Detroit, Mich. Application Sept. 8, 1939, Serial No. 293,938. 3 Claims. (Cl. 62—115.)



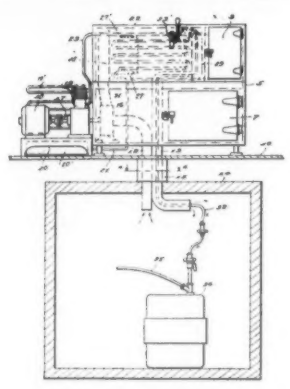
1. In a refrigerating system, the combination with a refrigerant evaporator having an inlet for refrigerant liquid and an outlet for refrigerant vapor leading from the vapor space of the evaporator; refrigerant condensing means having its refrigerant vapor inlet connected with the said outlet of the evaporator and its refrigerant outlet connected with the said inlet of the evaporator; means for controlling admission of liquid refrigerant into the evaporator; and control means for the refrigerant condensing means causing the latter to operate intermittently to withdraw refrigerant from the said vapor space of the evaporator.

2,230,892. PURIFICATION OF VOLATILE REFRIGERANTS. Bruce De Haven Miller, Louisville, Ky., assignor to The Girdler Corp., Louisville, Ky., a corporation of Delaware. Application Dec. 28, 1938, Serial No. 248,045. 10 Claims. (Cl. 62—115.)



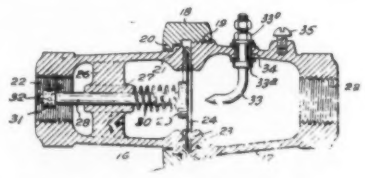
1. In a refrigerating system of the type having a compressor, the method of removing lubricant from the system which includes lowering the temperature of a flowing stream of the liquid refrigerant while under pressure to a temperature at which the oil tends to separate, thereafter reducing the velocity of said stream.

2,230,905. BEVERAGE COOLING APPARATUS. Louis L. Popky, Wilkes-Barre, Pa. Application May 15, 1940, Serial No. 335,401. 3 Claims. (Cl. 62—141.)



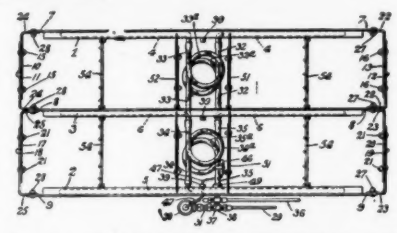
1. In a beverage cooling and dispensing apparatus, a storage room having a beverage container positioned therein, a portable dispensing cabinet remotely positioned with respect to said room, a pair of air ducts connecting the room with the cabinet, a cooling coil positioned in the cabinet, a pair of heads positioned in the cabinet at opposite ends of the coil and having perforated opposed faces.

2,230,961. LEAK ALARM FOR REFRIGERATING SYSTEMS. Ralph Lewis, Montreal, Quebec, Canada. Application June 13, 1940, Serial No. 340,403. 4 Claims. (Cl. 177—311.)



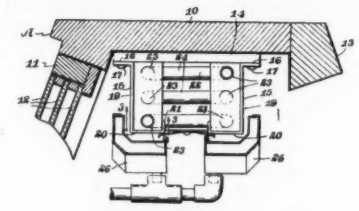
1. In a fluid pressure system, in combination with a relief valve and vent pipe leading therefrom, a diaphragm closing said pipe outwardly of the valve; a plunger between the diaphragm and valve spring pressed against the diaphragm and constituting one contact in an alarm circuit; a second contact on the opposite side of said diaphragm from the plunger, electrically insulated from the plunger.

2,231,012. COOLING APPARATUS. Herman W. Kleist, Chicago, Ill., assignor to Dole Refrigerating Co., Chicago, Ill., a corporation of Illinois. Application Dec. 23, 1938, Serial No. 247,458. 8 Claims. (Cl. 62—99.)

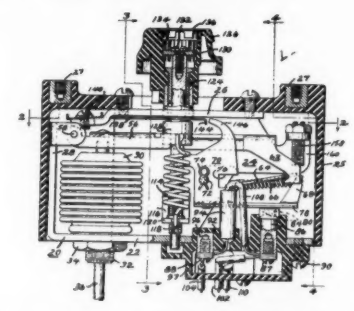


1. A cooling cabinet conversion unit comprising a plurality of separated plates, each made up of a pair of sheets with a space between them, a pipe extending back and forth in the space of each of said plates, through which refrigerant material is circulated, adjustable uniting devices connecting the plates together so as to permit the plates to be moved relatively to adjust them to proper positions to fit into a cabinet.

2,231,398. REFRIGERATOR COIL MOUNTING. Herman J. Strobush, George H. Platten, and Donald Swanson, St. Paul, Minn., assignors to Seeger Refrigerator Co., St. Paul, Minn., a corporation of Minnesota. Original application Sept. 20, 1937, Serial No. 164,742. Divided and this application Jan. 23, 1939, Serial No. 252,268. 5 Claims. (Cl. 62—99.)

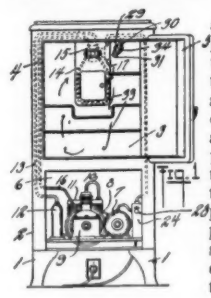


2,231,532. REFRIGERATING APPARATUS. Albert O. Grooms, Dayton, Ohio, assignor to General Motors Corp., Dayton, Ohio, a corporation of Delaware. Application April 16, 1938, Serial No. 202,515. 10 Claims. (Cl. 200—83.)



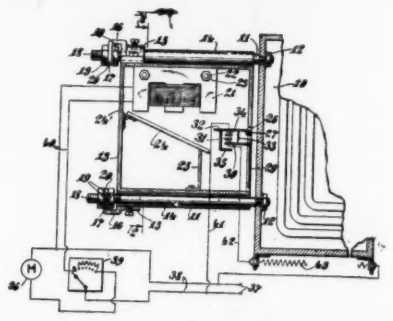
1. A refrigerator control comprising a temperature responsive switch operating means, a snap acting switch means operated by said temperature responsive means, a normal stop means providing a normal differential for said snap acting switch means, an abnormal stop means providing an abnormal differential for said snap acting switch means, means for temporarily rendering ineffective said normal stop means and rendering said abnormal stop means effective.

2,231,628. DEFROSTER. Harold P. Knorr, Maumee, Ohio, assignor of one-half to Bert E. Harris, Toledo, Ohio. Application Nov. 21, 1936, Serial No. 112,163. 13 Claims. (Cl. 62—4.)



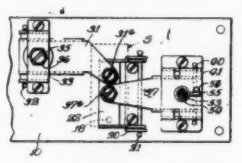
1. In a refrigerator, a mechanical temperature - affecting unit, a primary control therefor responsive to temperatures created by said unit, and a remote supplemental control therefor operable by temperatures independent of the temperatures created by said unit for periodically rendering the primary control effective.

2,231,653. AUTOMATIC DEFROSTER. George Baxter, Marion, Kan. Application Jan. 25, 1938, Serial No. 186,763. 14 Claims. (Cl. 62—1.)



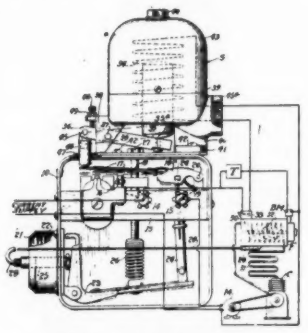
1. An automatic defrosting mechanism comprising means to test the thickness of a layer of ice intermittently, and means responsive to a predetermined thickness of ice for applying heat to the said ice layer.

2,231,688. CONTROL FOR REFRIGERANT COMPRESSORS. Burton E. Shaw, Bristol, Ind., assignor to Penn Electric Switch Co., Goshen, Ind., a corporation of Iowa. Application Aug. 29, 1938, Serial No. 227,312. 7 Claims. (Cl. 62—4.)



1. In a control for refrigerating systems, a switch, an actuating element therefor having cut-in and cut-out points substantially spaced from each other due to the differential of operation of the switch, pressure responsive means connected with a refrigerant conduit of the refrigerating system and cooperating with said switch to move it to cut-out and cut-in positions depending upon pressure conditions in the refrigerating system, and temperature responsive means responsive to the temperature in the space being refrigerated.

2,231,689. SWITCH STRUCTURE. Burton E. Shaw, Bristol, Ind., assignor to Penn Electric Switch Co., Goshen, Ind., a corporation of Iowa. Application Jan. 2, 1940, Serial No. 312,182. 9 Claims. (Cl. 62—4.)



1. A switch structure comprising a refrigerant compressor motor switch normally responsive to the temperature of a freezer, a solenoid operable upon energization to close said switch independent of its response to the temperature of the freezer, a timer controlled freezer mixer motor, a timer therefor, circuit connections with said timer.

2,231,797. AIR CONDITIONING UNIT. Clifford C. Carson, St. Louis, Mo. Appli-

(Concluded on Page 19, Column 1)

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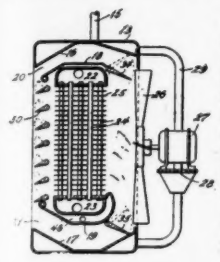
Patents (Cont.)

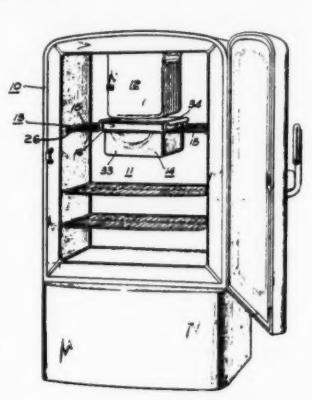
(Concluded from Page 18, Column 5)

cation Jan. 24, 1938, Serial No. 186,714. 7 Claims. (Cl. 257—137.)



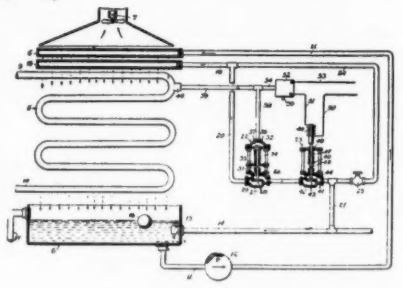
5. Apparatus of the class described comprising a heat exchanger; means for producing a stream of air flowing therethrough; means for simultaneously producing a separate stream of air either above or below the stream issuing from the heat exchanger.

2,231,817. REFRIGERATION APPARATUS. Anthony A. Quimper, Westfield, Mass., assignor to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., a corporation of Pennsylvania. Application April 15, 1939, Serial No. 267,979. 4 Claims. (Cl. 62—89.)



1. In a refrigerator, the combination of an insulated chamber having an opening therein, a door for said opening, a cooling unit in said chamber, a shelf having an open section disposed directly beneath said cooling unit, a pair of parallel slide rails adjacent said open section and secured to said shelf, a food storage receptacle comprising a pan and a cover therefor, outwardly-turned flanges on said pan, said flanges engaging said rails to suspend said pan therefrom and in close proximity to said cooling unit.

2,231,856. REFRIGERATING APPARATUS. Thomas S. Wetter, New York, N. Y.; Pauline L. Wetter, Kings County, N. Y., administratrix of Thomas S. Wetter, deceased. Application Aug. 13, 1938, Serial No. 224,719. 3 Claims. (Cl. 257—2.)



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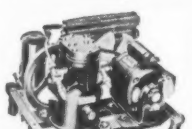

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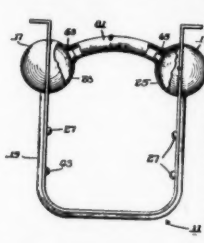
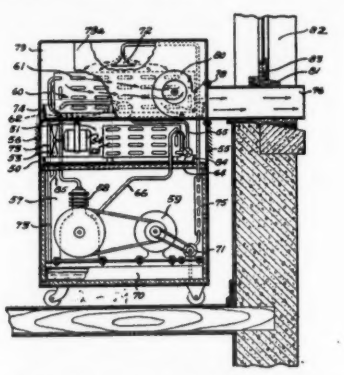
1. In a refrigerating condenser a condenser coil; evaporator type of cooling means for cooling the coil comprising means for spraying water on the coil, a fan for directing a current of air over the coil so as to evaporate a portion of the water, a drip pan positioned beneath the coil for receiving the unevaporated portion of the water, and a pump for recirculating the unevaporated portion of the water from the drip pan to the spray means; and auxiliary cooling means for cooling the coil comprising means for spraying suffieient additional water on the coil to cause it to operate as an atmospheric condenser.

2,232,176. EVAPORATOR. Robert G. Guthrie, Chicago, Ill., assignor to Chicago By-Products Corp., a corporation of Illinois. Application Jan. 15, 1935, Serial No. 1,917. Renewed Dec. 30, 1938. 1 Claim. (Cl. 62—126.)

An evaporator comprising a sheet metal shell having spaced apart header-forming portions, said portions being formed each with an opening defined by a fillet extending outwardly, and a connection between said header portions comprising a tubular member receiving said fillets within its opposite ends and sealingly secured on said fillets by an alloy formed in situ throughout the space between the engaging surfaces of the fillets and the end portions of the tubular member.

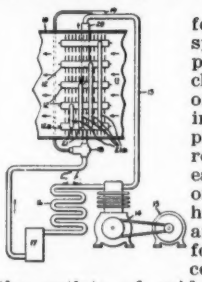


2,232,459. REFRIGERATING APPARATUS. Harry B. Hull, Dayton, Ohio, assignor to General Motors Corp., Dayton, Ohio, a corporation of Delaware. Application Oct. 24, 1934, Serial No. 749,772. 7 Claims. (Cl. 62—140.)



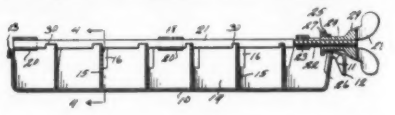
1. Air conditioning apparatus for a room or the like comprising a cabinet provided with a heat absorber and a heat dissipator therein, means to circulate air over said heat dissipator.

2,232,568. COOLING UNIT. Warren A. Spofford, Glen Ridge, N. J., assignor to General Electric Co., a corporation of New York. Application Feb. 27, 1940, Serial No. 321,031. 4 Claims. (Cl. 62—126.)



1. A cooling unit for a refrigerating system comprising a plurality of heat exchange elements, one of said elements having an inlet and a plurality of outlets remote from said inlet, each of the remaining ones of said elements having an inlet and an outlet, an outlet for said cooling unit communicating with the outlets of said remaining elements.

2,232,651. ICE CUBE TRAY. Hugh Lawley Binford, Houston, Tex., assignor, by mesne assignments, to General Motors Corp., Detroit, Mich., a corporation of Delaware. Application July 13, 1937, Serial No. 153,417. 6 Claims. (Cl. 62—108.5.)



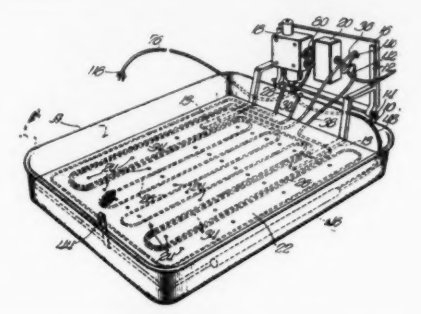
1. An ice tray having an upstanding rim, a compartment-defining grid therein, the grid having a portion thereof formed with a longitudinally extending screw thread extending over the rim of the tray, and an annular wedging member mounted upon the screw thread.

2,232,861. DEVICE FOR QUICKLY COOLING BEER AND DISPENSING SAME. Stephen Mezzapesa, New York, N. Y. Application Nov. 22, 1938, Serial No. 241,746. 4 Claims. (Cl. 62—141.)

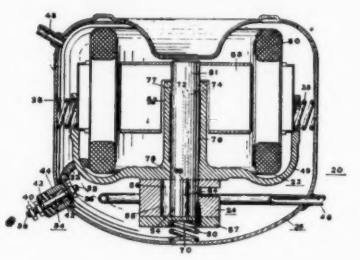
1. A unit, in the form of a bell-shaped vessel, for cooling liquid, constructed of three closely spaced substantially concentric walls, the outermost and innermost of said walls being connected together at the edge of the vessel and the intermediate wall terminating short of said edge, the three walls cooperating to form a pair of annular passages communicating at said edge, an inlet being provided at the closed end of the vessel for one of said passages for introducing the liquid to be cooled and an outlet being provided for the other of said passages also at said closed end for the discharge of the liquid from the vessel, both surfaces of the vessel being in contact with cooling medium when the vessel is set in a container having cooling medium therein.

2,232,998. TEMPERATURE CONTROL FOR SOLUTIONS. James F. Cernohouz and George E. Franck, Chicago, Ill. Application June 27, 1938, Serial No. 216,102. 9 Claims. (Cl. 257—4.)

1. A temperature control apparatus for maintaining a selected temperature in a body of liquid comprising a vat for the liquid, a base for supporting the vat, a false bottom for the vat removably positioned therein, an elongated refrigeration coil held against the false bottom in open position so as to cover a large area of the vat.

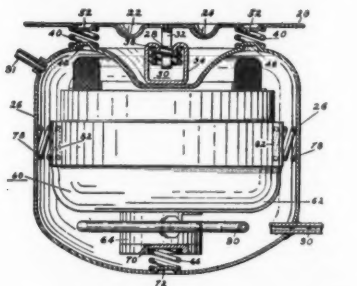


2,233,082. COMPRESSOR FOR REFRIGERATING APPARATUS. Andrew A. Kucher, Dayton, Ohio. Application Aug. 28, 1936, Serial No. 98,360. 14 Claims. (Cl. 230—153.)



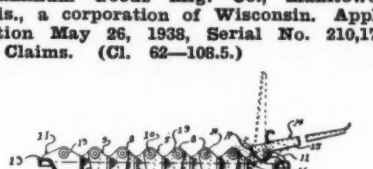
1. In a rotary compressor, in combination, a cylinder, a bearing, a shaft journalled in the bearing, said shafts being less in diameter than the diameter of the cylinder, and extending into the cylinder, said shaft having uniform diameter within the bearing and cylinder and bearing tangentially against and in sealing engagement with a wall of the cylinder.

2,233,102. REFRIGERATING APPARATUS. Andrew A. Kucher, Dayton, Ohio. Application Aug. 10, 1936, Serial No. 95,091. 2 Claims. (Cl. 248—26.)



1. In combination, a support, a frame carried by the support, a vibratory mechanism within the frame, a centrally disposed resilient means carried within the frame and resiliently supporting said vibratory mechanism and mechanism comprising the sole means for limiting lateral movement of the vibratory mechanism.

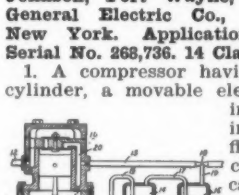
2,233,148. ICE CUBE RELEASE. Earl O. Vits, Manitowoc, Wis., assignor to Aluminum Goods Mfg. Co., Manitowoc, Wis., a corporation of Wisconsin. Application May 26, 1938, Serial No. 210,178. 3 Claims. (Cl. 62—108.5.)



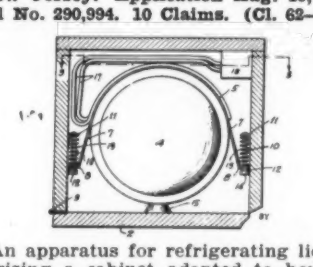
2. A grid for ice cube trays comprising, a plurality of sections each consisting of a longitudinal plate, a transverse fin carried thereby, pintles pivotally connecting said longitudinal plates together.

2,233,168. COMPRESSOR. Wilfrid E. Johnson, Fort Wayne, Ind., assignor to General Electric Co., a corporation of New York. Application April 19, 1939, Serial No. 268,736. 14 Claims. (Cl. 230—187.)

1. A compressor having a crankcase, a cylinder, a movable element in said cylinder for displacing a working fluid, an inlet chamber communicating with said cylinder and receiving lubricant from the external part of the refrigerant circuit, a suction line communicating with said inlet chamber and means for returning the lubricant entering said inlet chamber to said crankcase.



2,233,272. APPARATUS FOR REFRIGERATING LIQUIDS. William Tamminga, Bronx, N. Y., assignor to Monitor Process Corp., Jersey City, N. J., a corporation of New Jersey. Application Aug. 19, 1939, Serial No. 290,994. 10 Claims. (Cl. 62—141.)

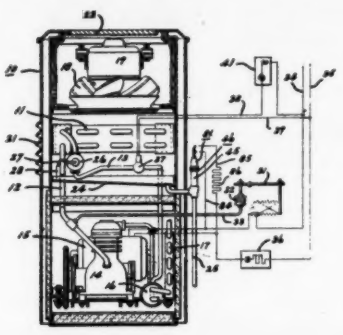


1. An apparatus for refrigerating liquids comprising a cabinet adapted to house a can, a plate shaped to substantially conform to the contour of the can.

REISSUES

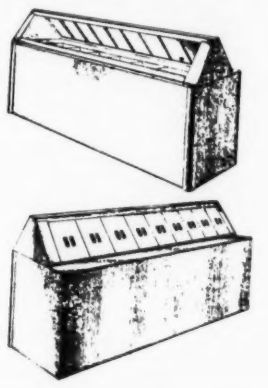
21,710. REFRIGERATING APPARATUS. Harry F. Smith, Lexington, Ohio, assignor to General Motors Corp., Dayton, Ohio, a corporation of Delaware. Original No. 2,085,172, dated June 29, 1937, Serial No. 96,823, Aug. 19, 1936. Application for reissue June 20, 1939, Serial No. 280,130. 11 Claims. (Cl. 62—4.)

11. An air conditioning apparatus comprising an air cooling unit, a refrigerant circulating unit connected to said cooling unit, collecting means for collecting con-



densate from said air cooling unit, and means preventing the operation of said circulating unit upon the accumulation of a predetermined amount of liquid in said collecting means.

125,283. DESIGN FOR A REFRIGERATED STORAGE AND DISPLAY CABINET. Lotus F. Miller, Cambridge City, Ind. Application Nov. 6, 1940, Serial No. 96,366. Term of patent 14 years.



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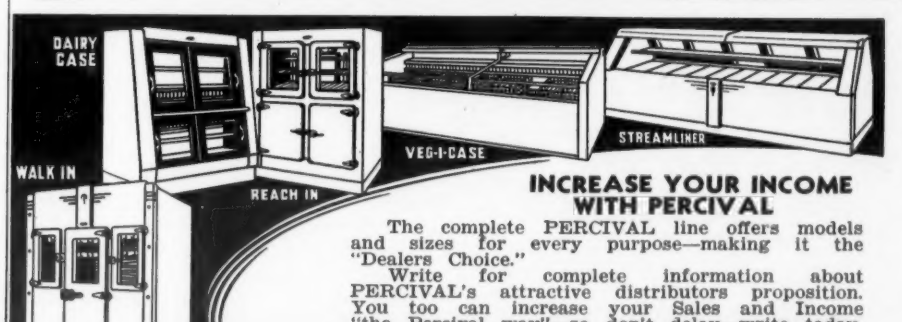

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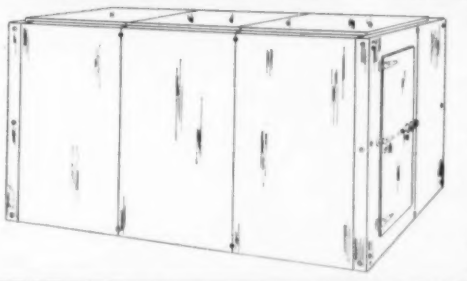

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Texas Utility's Move To 'Protect' Buyers Of Commercial Units Stirs Controversy

(Concluded from Page 1, Column 2)

Utility officials vigorously deny any such prejudicial attitude, however, and offer as proof of this contention the fact that one of the company's own employes has built a locker plant equipped with the low pressure type of system. Only thing which prompted the action, the utility executives insist, was the frequency of complaints received from plant operators that power costs were far in excess of what they had been led to expect.

One of the principal reasons for this situation, it was explained, is the fact that many plants have been built on plans taken directly from similar set-ups in the northern states, without regard for the fact that the abundant supply of cold water available in these northern states makes possible effective operation with relatively small cooling tower capacity.

CONDENSERS INADEQUATE

Result of this practice is that many Texas plants lack adequate evaporative condenser area to meet the climatic conditions of this state. Such plants naturally demand a vastly greater power load than would an identical plant in a more temperate region.

It is the conviction of utility officials that the company, through its advisory service, can assist firms engaged in the building of locker plants to establish sound reputations for effective and efficient installations. Once these companies have established such reputations, the utility officials believe, they will apply their best efforts in an attempt to maintain them, and the installation problems which have risen so often in the past will be largely eliminated.

Some of the reasons for the wide variation in power consumption of various locker plants having the same electric service rate were suggested by J. W. Stockham of Texas Power & Light Co. in a paper which he delivered at the Food Preservation Conference held at the University of Texas last month.

A summary of these reasons follows:

"1. More or less meat curing and other cold storage space requirements compared to the number of lockers.

"2. Quality and thickness of insulation.

"3. Some plants are carrying more refrigerated space designed for future lockers.

"4. Some plants have more motor driven equipment than others.

"5. Amount of evaporator surface in rooms, condenser surface, cooling tower, controls, quality of refrigerant, amount of foreign gas in refrigerated system, and size of all piping and other details of design affect the power consumption.

"6. Some have more rapid business growth than others.

"7. Some are just better operators.

"8. Texas has more plants of the complete service type."

RECOMMENDED PRACTICES

An indication of the utility's attitude on various phases of plant design also was offered by Mr. Stockham in his paper when he made these suggestions:

"Refrigeration equipment for locker plants is sold on the basis of being entirely automatic for continuous operation, and should be designed and erected with that kind of service in view.

"To get such high class service over a plant life of 15 or 20 years with a low maintenance cost requires that the condenser cooling equipment be ample, simple in construction, and foolproof in that the compressor will operate under low discharge pressures compatible with the lowest temperatures that can be obtained economically by atmospheric cooling in that part of the state.

"With compressors operating at such low evaporating temperatures as —21° to —25° F. for the freezing rooms, it is axiomatic that low unit power cost then depends upon low discharge pressures.

"Discharge pressures corresponding to liquid refrigerant temperature 10° above the wet bulb temperature are easily obtained and should be held within this limit.

"With compressors operating at such low evaporating temperatures it is also economical to make the suction pressure at the compressor correspond with such evaporator temperatures. It is also important to maintain high relative humidities in the locker room to prevent the dessication of foods held there for long periods.

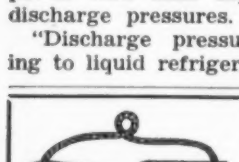
DESIGN CONDITIONS

"Both of the above conditions are obtained by designing the coils for about 10° difference between room and evaporator temperatures.

"Blast freezer units with 1¼-inch flooded pipe coils are being installed in the freezer rooms, both propeller and centrifugal type fans being used to obtain 10 air changes per minute.

"If the refrigeration system is not designed tight enough to keep air out of the refrigerant, then include a non-condensible gas remover.

"Ample receiver capacity is necessary for holding refrigerant during periods of heavy 'pumpdown.'"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M. G. VOLCKER - 112 E. 19 ST.-NEW YORK

Hotpoint Will Build Campaign Around Millionth Range

(Concluded from Page 1, Column 3)

chairman of the Hotpoint company.

This first Hughes electric range now rests in the Greenfield Museum, Greenfield, Mich., where it will be joined by Hotpoint electric range No. 1,000,000.

In that same period, the electric range factory that began in a Dearborn St. basement progressed to a loft on Superior St., a small factory on Schiller St., and thence to the first unit of the present Hotpoint plant at 5600 West Taylor St., Chicago.

In planning its production schedule, the Hotpoint range division found that No. 1,000,000 would be a 1941 Aristocrat model. To set it apart, as a fitting milestone to 31 years of electric range progress, a special 24-karat gold hardware and trim was prepared. This includes the backsplasher trim, Calrod trim rings, switch buttons, door handles, and the Hotpoint triangle-H insignia on the lamp stand.

Several exact replicas of Hotpoint electric range No. 1,000,000 have been made, complete with gold trim, to be put on display in various parts of the country. A number of housewives who are getting new Hotpoint electric ranges at this time, will have an opportunity to secure replicas of the one-millionth for installation in their own kitchens.

At no additional cost, and for a limited time, Hotpoint Aristocrat models will have 24-karat gold nameplates, set into the backsplasher, in place of the usual chrome nameplate, to distinguish them as replicas of Hotpoint electric range No. 1,000,000.

Anticipating production of Hotpoint electric range No. 1,000,000, the Hotpoint range sales division has prepared a complete plan of merchandising, advertising, and publicity, commemorating the millionth range.

Production of the milestone model will be announced to the public in a full-page advertisement in gold, scheduled for the April 28 issue of "Life" Magazine.

The exact replicas form the nucleus of the retail activity, "Commemorating the One-Millionth Hotpoint Electric Range." Wide blue ribbon bands, printed in gold with the words, "Commemorating the One-Millionth Hotpoint Electric Range," will supplement the special window and store display backgrounds which have been made available to retailers for this activity.

Special invitation mailing pieces for retailers to invite the public to visit their stores to inspect the replica, and receive a special commemorative gift of a handsome, colorful, "around-the-calendar" meal-planner.

During the commemoration activity, retailers and salesmen, as well as Hotpoint distributor and field organization members, will wear gold-colored lapel buttons, also commemorating the millionth range.

York Stockholders OK Merger; Suit Delays Action

YORK, Pa.—At a meeting of stockholders of York Ice Machinery Corp. last week, assents to the merger and recapitalization of the company were received from stockholders holding 39,038 shares of preferred, representing 73% of the total, and 119,880 shares of common, representing 74% of the total.

At the same time, dissents to the plan were filed covering 6,179 shares of preferred, representing 11.6%, and 1,042 shares of common, representing .7%.

Stockholders were informed that a suit to enjoin the merger had been filed in Wilmington, Del., and that hearing of this suit had been set for April 3. This suit does not prevent holding of the stockholders' meeting, and it is believed its outcome will be favorable to the company.

While the proxies in favor of the merger were more than sufficient for its adoption, it was decided that, in view of the existence of the suit and the number of filed dissents, the meeting should be adjourned to May 20.

"The board of directors and a large percentage of the stockholders are convinced that the proposed merger is an essential step in the simplification and adjustment of the present unsatisfactory capital structure of the company," said Stewart E. Lauer, York president.

Theory and Practice At Toronto Meeting

"Information Please" session with "experts" R. J. Thompson, Kinetic; J. J. Goodwin, Temprite; Paul Penn, Penn Switch; Paul Domke, Mueller Brass; and Ron Jones, Ottawa service man. Harry Parish (center) was question-master.

Hard at work in the Mueller Brass soldering contest during the recent Canadian Show are C. G. Pinke and Hilton Arthur, Ottawa, and Frank H. Tunney, Toronto, under the watchful eye of Mueller's Paul Domke.

RESPONSIBLE
Refrigerant Control . .

● Today in many refrigerated storage rooms the country over, large shipments of perishable foods are being held for reshipment or ageing.

● That, which guards these foods from spoilage, is this little valve — a dependable A-P Thermostatic Expansion Valve.

● Have you ever before realized the responsibility that rests in this little valve? It far outshines the mechanical and engineering perfection built into it by A-P.

● When you service or install equipment that guards perishable products insist on A-P Valves. They're Dependable. And fulfill their responsibility to you and to your customers — dependably.

● Progressive Service Engineers use and Recommend — and aggressive Jobbers stock and talk — A-P Products.

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